

CURRICULUM VITAE ET STUDIORUM

ARMANDO BARTOLAZZI M.D., Ph.D.

(ANAGRAFICA E RIASSUNTO DATI SALIENTI)

Name: ARMANDO BARTOLAZZI

Date of Birth: 11th February 1961;

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Current Position

- Since June 2018 **Undesecretary of State Italian Ministry of Health**

- November 2001-June 2018 *Dirigente* First Level (Prof. of Pathology), with high specialized profile in Thyroid Pathology. **St. Andrea University Hospital, Rome, Italy** (*Permanent Position*). (via di grottarossa 1035 -00189 Rome, Italy, Public Institution)

- Research Associate Department of Oncology-Pathology Cancer Center Karolinska, **Karolinska Hospital, Stockholm Sweden**. (CCK R8:04 – 17176 Solna, Sweden - Public Institution and University Medical School) - research collaboration

Previous Positions

May 1999-November 2001: Visiting Scientist, Department of Oncology-Pathology, Cellular and Molecular Tumor Pathology Lab, Cancer Centre Karolinska, CCK R8:04 **Karolinska Hospital, Stockholm, Sweden** (Public Cancer Institution and University Hospital)

January 1994 November 2001 *Dirigente* First Level (Assistant Professor of Pathology), Department of Pathology **National Cancer Institute Regina Elena, IRCCS**, viale Regina Elena 291 - 00100 Rome, Italy (*Permanent position*). (*National Cancer Institute*)

1993-94: - Post-doctoral fellow, at the Pathology Research Laboratory, Department of Pathology, Massachusetts General Hospital, **Harvard Medical School, Boston MA, (USA)**. (Prof. Ivan Stamenkovic Lab.) (*Public /Privat Institution Harvard University Boston- USA*)

Since 1994: Principal Investigator (P.I.) of an independent research group at the NCI Regina Elena of Rome (IRCCS) and presently at St. Andrea University Hospital of Rome, focused on **Cancer Research and Translational Research in Pathology and Oncology**. (National Cancer Institute) – via delle Messi D’Oro Centro di Ricerca Sperimentale – 00167 Rome, Italy

1988-92: Research fellow at the Immunology Laboratory, **National Cancer Institute, Regina Elena of Rome (IRCCS)**, Italy. PhD Program in Clinical and Experimental Oncology (Prof. P.G. Natali lab.) via delle Messi D’Oro Centro di Ricerca Sperimentale – 00167- Rome, Italy (*National Cancer Institute*)

Education

1999- Specialist Degree in Histology and Anatomic Pathology (1994-1999), with final thesis and Diploma (*summa cum laude*). University "La Sapienza" of Rome, Italy (Title: Galectin-3 and Thyroid Cancer). Rome 24-11-1999

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1993-94: - Post-Doctoral fellow, at the Pathology Research Laboratory, Department of Pathology, Massachusetts General Hospital, Harvard Medical School, Boston, MA, (USA). (Ivan Stamenkovic Lab.)

1991: Specialist Degree in Clinical Oncology (Experimental Oncology and Ph.D. program) (1987-1991) with final dissertation and Diploma (*summa cum laude*). National Cancer institute Regina Elena Rome, IRCCS and University "La Sapienza", Rome, Italy (Title: Production and characterization of monoclonal antibodies to V α -3 integrin).- Rome 28-10-1991

1987-1988: Internship in Internal Medicine, I^o Clinica Medica Policlinico Umberto I, University "La Sapienza", Rome, Italy.

1987: M.D. license, University "La Sapienza", Rome, Italy. - Rome 15-10-1994.

1987: M.D. Degree University "La Sapienza", Rome, Italy, (*Summa cum laude*). (Thesis: Epidemiology of Endometrial Cancer in Italy. Prof. Giuseppe Atlante) Rome 10-4-1987

Clinical competence and formal training

Number of years as specialist, and experience in inpatient and outpatient care. The applicant worked since 1991 as specialist in Oncology in particular in the area of diagnosis and follow-up of cancer patients. (Outpatient care).

From December 1993 to October 2001: Assistant Professor of Pathology at the National Cancer Institute Regina Elena of Rome IRCCS (*permanent position*). (40.000 histological slides/year, 9000 intra-operative diagnosis/year for five pathologists at the Department - Two years work experience were matured at the Cytology Department (Inpatient and outpatient care).

January 1997- March 99: designed pathologist for the multi-disciplinary clinical and experimental working group on Breast Cancer (600 cases/year) at the National Cancer Institute, Regina Elena of Rome. (Inpatient and outpatient care).

January 1997- March 99: designed pathologist for the multi-disciplinary clinical and experimental working group on Colon Cancer (180 cases/year) at the National Cancer Institute, Regina Elena of Rome (Inpatient and outpatient care).

January 1997- March 99: designed pathologist for the multi-disciplinary clinical and experimental working group on Melanoma (110 cases/year), at the National Cancer Institute, Regina Elena of Rome (Inpatient and outpatient care).

January 1996- March 99: designed pathologist for the autopsy service at the National Cancer Institute, Regina Elena of Rome.

1996-1998: Consultant Pathologist at the General Hospital S.S. Salvatore, (Regional Hospital), USL RM/25 Rome, Italy (Inpatient and outpatient care; 5155 histological diagnosis, personally signed).

2001: Consultant Pathologist for melanoma at Dept. of Oncology-Pathology Karolinska Hospital, Stockholm, Sweden.

Since November 2001-present: Dirigente First Level (Professor of Pathology) Sant' Andrea University Hospital, II° Faculty of Medicine, University Sapienza, Rome, Italy (about 12.000 histological cases / year) (*permanent position*). *

Special Clinical competence/profile area

- Tumor Pathology (subspecially expertise in Head and Neck Cancer, Thyroid cancer and Skin Cancer including Melanoma).

- Diagnosis in Oncology (clinical and histopathological diagnosis, immunodiagnosis, molecular diagnosis).
- Intra-operative histological diagnosis.
- Autoptic diagnosis.
- Clinical management of cancer patients during the diagnostic phase and follow-up.

Special Experimental competence/profile area

-Translational research in Oncology and Pathology 30 years of experience in production, characterization and clinical applications of monoclonal antibodies directed to tumor associated antigens. Some of these reagents are routinely used in several National and International Institutions for immuno-diagnosis, differential diagnosis of neoplastic diseases, for characterizing cancers of unknown origin and for evaluating intra- and post-operatively the minimal residual disease.

The recently developed galectin-3 thyrotest for the preoperative characterization of thyroid nodules has been developed and validated at international level for clinical use (see specific scientific portfolio for details).

The Department of Pathology and Immunology of the NCI Regina Elena of Rome, in which the applicant worked for many years, has been the datum point for immunocyto-histochemistry for both National and International Institutions and Research Companies. In this work environment the applicant contributed to develop and organize one of the first human tissue bank and cell culture bank in Italy (reference Prof. Pier Giorgio Natali, past Scientific Director of the NCI of Rome and Head of the Immunology Laboratory.

Commissions of trust

1998-2001, Elected member of the Scientific and Technical Committee (STC) at the National Cancer Institute Regina Elena, IRCCS, Rome. Italy.

Other Merits

Credits from the Italian Minister of Public Health, Work and Social Politics for the Clinical and Scientific activities on Thyroid Cancer, Rome, February 13th, 2009

Selected by AIRC (Italian Association for Cancer Research) as one of the best 12 researchers providing significant scientific contribution in the Cancer field for the year 2008 (*Repubblica November 4th, 2008; Repubblica e Corriere della Sera July 28th, 2008*).

******Thyroid Cancer Expert nomination: World Health Organization (Lyon cedex DB, France) – WHO expert for thyroid Cancer , June 30, 2015******

Abilitazione Ministeriale a Professore Ordinario (Full-Professor) MED 08 Anatomia Patologica (primo Bando 2012)

Abilitazione Ministeriale a Professore Ordinario (Full-Professor) MED 04 Patologia Generale (primo Bando 2012)

*******Since February 2015 listed on TIS –Top Italian Scientists - Via-Academy <http://www.via-academy.org> *******

******* President of the 68th session of the WHO regional Committee for Europe *****
Rome, Italy 17-20 September 2018**

Grants: Since 1994 the applicant was granted with about 1.263.000,00 euro for cancer research projects, from several National and International Agencies .

International referee activity

The Lancet

Cancer Research

Journal of Clinical Oncology

International Journal of Cancer

American Journal of Pathology

European Journal of Cancer

British Journal of Cancer
British Journal of Dermatology
PLoS One
Thyroid
Journal of Endocrinology Investigation
Molecular Endocrinology
Histopathology
Journal Biological Chemistry
Journal of the American Academy of Dermathologists (JAAD)
Others.....

Rare Tumors (**Editorial Board**)

Intrnational Journal of Molecular Sciences (**Guest Editor**- special issue) 2017-2018

- **Patent**

Anticorpi monoclonali anti-galectina-3 radio marcati per visualizzazione e radio ablazione in vivo di tumori galectina-3 positivi

Inventor: Armando Bartolazzi

Co-inventors: Francesco Scopinaro; Alberto Signore; Rome February 2nd 2008, Patent. N. RM2008A000097

SCIENTIFIC PORTFOLIO

Approved by the Board of Research, January 1st 2008

Karolinska Institute

ARMANDO BARTOLAZZI M.D., Ph.D.

September 2018

2. Scientific production

106 original papers published on international scientific journals in the field of cancer research and translational research in Oncology and Pathology

Total amount of quotations in scientific publications and a list of the top 20 papers

Total citations: 4889 (100 publications total). Source Google Scholar 2018

H-index: 33

i10-index: 66

1. **Bartolazzi, A.**, Mottolose, M., Vocaturo, A., Bigotti, A., Vocaturo, G., Atlante, G., Prat, M and Natali, PG. (1991). Expression of CAR-3 and TAG-72 macromolecules in normal and transformed endometrium. Potential diagnostic application in postmenopausal age. Cancer Res. 51, pp. 3001-3005.
2. **Bartolazzi, A.**, Peach, R., Aruffo, A., and Stamenkovic, I. (1994). CD44-hyaluronate interaction is implicated in the regulation of tumor growth. J. Exp. Med. 180, pp. 53-66.
3. **Bartolazzi, A.**, Jackson, D., Bennett, K., Aruffo, A., Dickinson, R., Shields, J., Whittle, N. and Stamenkovic, I. (1995). Regulation of growth and dissemination of a human lymphoma by CD44 splice variants. J. Cell Sci. 108, pp. 1723-1733.
4. Bennett, KL., Modrell, B., Greenfield, B., **Bartolazzi, A.**, Stamenkovic, I., Peach, R., Jackson, G., Spring, F. and Aruffo, A. (1995). Regulation of CD44 binding to hyaluronan by glycosylation of variably spliced exons. J. Cell Biol. 131, pp. 1623-1633.
5. **Bartolazzi, A.**, Nocks, A., Aruffo, A., Spring, F., and Stamenkovic, I. (1996). Glycosylation of CD44 is implicated in CD44-mediated cell adhesion to hyaluronan. J. Cell Biol. 132, pp. 1199-1208.
6. Martegani, M.P., Del Prete, F., Gasbarri, A., Natali, P.G., and **Bartolazzi, A.** (1999). Structural variability of CD44v molecules and reliability of immunodetection of CD44 isoforms, using mAbs specific for CD44 variant exon products. Am. J. Pathol. 154, pp. 291-300.
7. Gasbarri, A., Martegani, M.P., Del Prete, F., Lucante, T. Natali, P.G. and **Bartolazzi, A.** (1999): Galectin-3 and CD44v6 isoforms in the pre-operative evaluation of thyroid nodules. J. Clin. Oncol. 17, pp. 3494-3502.
8. **Bartolazzi A.** (2000): Improving accuracy of cytology for nodular thyroid lesions The Lancet 355:1661-1662.

9. Girnita, L., Girnita, A., Brodin, B., Xie, Y., Nilsson, G., Lundeberg, J., Wejde, J., **Bartolazzi, A.**, Wiman, C., and Larsson, O. (2000): Increased expression of Insulin-like growth factor-1 receptor (IGF-1R) in malignant cells expressing aberrant p53. Functional impact. Cancer Res. 60:5278-5283.
10. **Bartolazzi, A.**, Gasbarri, A., Papotti, M., Bussolati, G., Lucante, T., Khan, A., Inohara, H., Marandino, F., Orlandi, F., Nardi, F., Vecchione, A., Larsson, O., and the Thyroid Cancer Study Group. (2001). Application of an immunodiagnostic method for improving the preoperative diagnosis of nodular thyroid lesions. The Lancet 357: 1644-50.
11. Sjolin H., Tomasello E., Mousavi-Jazi M., **Bartolazzi A.**, Vivier E., Karre K., and Cerboni C. (2002): Pivotal role of KARAP/DAP12 adaptor molecule in the natural killer cell-mediated resistance to murine cytomegalovirus infection. J. Exp. Med. 195:825-834.
12. Xie Y., Skytting B., Nilsson G., Gasbarri A., Haslam K., **Bartolazzi A.**, Brodin B., Mandahl N., and Larsson O. (2002): SYT-SSX fusion gene is critical for expression of cyclin D1 in synovial sarcoma cells. Cancer Res. 62:3861-3867.
13. Girnita A, Girnita L, del Prete F, **Bartolazzi A**, Larsson O, Axelson M. (2004). Cyclolignans as inhibitors of the insulin-like growth factor-1 receptor and malignant cell growth. Cancer Res. 64:236-42.
14. Papotti M, Rodriguez J, Pompa RD, **Bartolazzi A**, Rosai J. (2005). Galectin-3 and HBME-1 expression in well-differentiated thyroid tumors with follicular architecture of uncertain malignant potential. Mod Pathol. 18:541-6.
15. B. Cecchinelli, L. Lavra, C. Rinaldo, S. Iacovelli, A. Gurtner, A. Gasbarri, A. Ulivieri, F. del Prete, M. Trovato, G Piaggio, **A. Bartolazzi**,* S. Soddu, & S. Sciacchitano. (2006). Repression of the antiapoptotic molecule Galectin-3 by homeodomain-interactin protein kinase 2-activated p53 is required for p53-induced apoptosis. Mol Cell Biol 26:4746-57. (* *Corresponding author*)
16. **Bartolazzi A**, Orlandi F, Saggiorato E, Volante M, Arecco F, Rossetto R, Palestini N, Ghigo E, Papotti M, Bussolati G, Martegani MP, Pantellini F, Carpi A, Giovagnoli MR, Monti S, Toscano V, Sciacchitano S, Pennelli GM, Mian C, Pelizzo MR, Rugge M, Troncone G, Palombini L, Chiappetta G, Botti G, Vecchione A, Bellocco R; Italian Thyroid Cancer Study Group (ITCSG). (2008). Galectin-3-expression analysis in the surgical selection of follicular thyroid nodules with indeterminate fine-needle aspiration cytology: a prospective multicentre study. The Lancet Oncol. 9(6): 543-9. Epub 2008 May 19.
17. **Bartolazzi A**, D'Alessandria C, Parisella MG, Signore A, Del Prete F, Lavra L, Braesch-Andersen S, Massari R, Trotta C, Soluri A, Sciacchitano S, Scopinaro F. (2008). Thyroid cancer imaging in vivo by targeting the anti-apoptotic molecule galectin-3. PLoS ONE. 3(11): e3768. Epub 2008 Nov20.

18. Rinaldo C, Moncada A, Gradi A, Ciuffini L, D'Eliseo D, Siepi F, Prodosmo A, Giorgi A, Pierantoni GM, Trapasso F, Guarguaglini G, **Bartolazzi A**, Cundari E, Schininà ME, Fusco A, Soddu S. HIPK2 controls cytokinesis and prevents tetraploidization by phosphorylating histone H2B at the midbody. Mol Cell. 2012 Jul 13;47(1):87-98. doi: 10.1016/j.molcel.2012.04.029. Epub 2012 May 31.
19. Valente D, Bossi G, Moncada A, Tornincasa M, Indelicato S, Piscuoglio S, Karamitopoulou ED, **Bartolazzi A**, Pierantoni GM, Fusco A, Soddu S, Rinaldo C. HIPK2 deficiency causes chromosomal instability by cytokinesis failure and increases tumorigenicity. Oncotarget. 2015 Apr 30;6(12):10320-34.
20. D'Alessandria C, Braesch-Andersen S, Bejo K, Reder S, Blechert B, Schwaiger M, **Bartolazzi A**. Noninvasive In Vivo Imaging and Biologic Characterization of Thyroid Tumors by ImmunoPET Targeting of Galectin-3. Cancer Res. 2016 Jun 15;76(12):3583-92. doi: 10.1158/0008-5472.CAN-15-3046. Epub 2016 May 23.

Le restanti pubblicazioni internazionali possono essere visualizzate ed eventualmente scaricate direttamente in originale dal sito ufficiale PubMed <https://www.ncbi.nlm.nih.gov/pubmed> US National Library of Medicine - NIH

Summary of overview articles and chapters in textbooks

Overview articles:

Bartolazzi, A. (2000): Improving accuracy of cytology for nodular thyroid lesions. The Lancet 355:1661-1662.

Bartolazzi A, Sciacchitano S, D'Alessandria C. Galectin-3: The Impact on the Clinical Management of Patients with Thyroid Nodules and Future Perspectives. Int. J. Mol. Sci. 2018 Feb 2;19(2). pii: E445. doi: 10.3390/ijms19020445. Review. PMID: 29393868

Bartolazzi A. Galectins in Cancer and Translational Medicine: From Bench to Bedside. Int J Mol Sci. 2018 Sep 27;19(10). pii: E2934. doi: 10.3390/ijms19102934. No abstract available.

Book's chapters:

1. Conti, EMS., Bartolazzi, A., Diotallevi, F., Crespi, M. (1987). Lineamenti di epidemiologia del carcinoma dell'endometrio. XIII Congresso Nazionale di Oncologia (S.I.P.D.T.) - I tumori dell'utero, dell'ovaio e della vulva- Monduzzi Edit. Vol. 1: pp. 461-473
2. **Bartolazzi, A.**, Mottolose, M., Prat, M., Vocaturo, A., Vocaturo, G., Atlante, G., Natali, PG. (1990). Potenziale immunodiagnostico degli AcMo AR-3 e B72.3 nel carcinoma dell'endometrio. - Atti della societa' Italiana di Ginecologia ed Ostetricia. - Class International Edition. Brescia
3. Natali, PG., Mottolose, M., Venturo, I., Salzano, M., Bartolazzi, A., **Perrone** Donnorso, R., Bigotti, A. (1990). Improvement of cytodiagnosis of solid tumors using a panel of monoclonal antibodies. In: Biological response modifiers. Application in clinical medicine. Indivieri, F., Puppo, F., Sudelletti, M.: Editors, pp. 314-323. Esculapio Bologna
4. Parisi, A., **Bartolazzi, A.**, Bonino, C., Camagna, M., De Monte, LB., Lombardi, A., Natali, PG., Paganelli, G., Tarditi, L., Vassarotto, C., Malavasi, F. and Mariani, M. (1992). BIS-1: a novel bispecific monoclonal antibody for CEA-expressing carcinoma radioimmunosintigraphy and radio immunotherapy. - In: New generation of monoclonal antibodies in diagnosis and therapy. Biotech RIA (Karger ed.)
5. **Bartolazzi, A.** (1999): CD44 ed acido ialuronico nella crescita e progressione neoplastica. *In*: Giavazzi, R., Lollini, PL., Bevilacqua, G. Invasione e metastasi Ed. da Pacini Editore; pp. 57-75.
6. Natali, PG, **Bartolazzi, A.** (1999). : Le molecole di adesione nella fisiopatologia della crescita e della progressione del melanoma cutaneo.. *In*: Giavazzi, R., Lollini, PL., Bevilacqua, G. Invasione e metastasi Ed. da Pacini Editore; pp. 207-222.
7. **Bartolazzi, A** (2004): Thyroid Fine Needle Aspiration Cytology. In Encyclopedia of Endocrinology and Endocrine Diseases. L. Martini Editor, Academic Press San Diego, CA, USA.
8. **Bartolazzi, A** (2009):. Non-small cell lung carcinoma: EGFR gene mutations and response to gefitinib. In Methods of Cancer Diagnosis, Therapy and Prognosis. M.A. Hayat Editor, Springer 1020 pgg.
9. **A. Bartolazzi**, Thyroid Fine Needle Aspiration Cytology. update to **B0-12-475570-4.01286-5 ELSEVIER INC**, 225 Wyman Street, Waltham, MA 02451, United States. Online Reference Database in **Biomedical Sciences** (2015 in press).
- ***** 10) A. Bartolazzi and co-authors : Follicular thyroid Cancer. In WHO Blue Books 4th Edition WHO Classification of Tumors of Endocrine Organs. World Health Organization (Lyon Cedex DB, France) – (2017) *****

11) A. Bartolazzi : Guest Editor of International Journal of Molecular Science; Special issue: Galectins in Cancer and Translational Medicine 2017-2018.

Short summary of the findings in the 10 most important articles published by AB in the past ten years

Articles with important implications in translational medicine (oncology and pathology)

1. Gasbarri, A., Martegani, M.P., Del Prete, F., Lucante, T. Natali, P.G. and **Bartolazzi, A.** (1999): Galectin-3 and CD44v6 isoforms in the pre-operative evaluation of thyroid nodules. J. Clin. Oncol.17, pp. 3494-3502.

In this paper the authors showed for the first time, at phenotypic and molecular level, the possibility to use the galectin-3 expression analysis in the preoperative characterization of thyroid lesions. Galectin-3 expression was demonstrated to be restricted to thyroid carcinomas whereas CD44v6 variant, a CD44 isoforms involved in tumor progression and metastatization in different tumor models (i.e. lymphoma, head and neck cancer and pancreatic carcinoma) was demonstrated to be expressed in different benign and malignant thyroid conditions, CD44v6 was expressed in all the proliferative lesions, including hyperplasia, but not in normal resting follicular thyroid cells.

2. Bartolazzi, A. (2000): Improving accuracy of cytology for nodular thyroid lesions. The Lancet 355 pp.1661-1662.

In this letter the author stressed, for the first time, the necessity to resolve the important clinical problem of the preoperative characterization of thyroid nodules and proposed a strategy for improving the diagnostic performance of conventional thyroid FNA-cytology, opening an interesting clinical discussion in many diagnostic laboratories worldwide.

3. Girnita, L., Girnita, A., Brodin, B., Xie, Y., Nilsson, G., Lundeberg, J., Wejde, J., **Bartolazzi, A.**, Wiman, C., and Larsson, O. (2000): Increased expression of Insulin-like growth factor-1 receptor (IGF-1R) in malignant cells expressing aberrant p53. Functional impact. Cancer Res. 60:5278-5283.

We investigated the functional impact of p53 on insulin-like growth factor I receptor (IGF-1R) expression in malignant cells. Using the BL-41tsp53-2 cell line, a transfectant carrying temperature-sensitive (ts) p53 and endogenous mutant p53 (codon 248), we demonstrated a drastic down-regulation of plasma membrane-bound IGF-1Rs on induction of wild-type p53. However, a similar response was obtained by treatment of BL-41tsp53-2 cells expressing mutant ts p53 with a p53 antisense oligonucleotide. Thus, even if the negative effect of wild-type p53 predominates under a competitive condition, these data indicate that mutant p53 may be important for up-regulation of IGF-1R. To further elucidate this issue, three melanoma cell lines (BE, SK-MEL-5, and SK-MEL-28) that over expressed p53 were investigated. The BE cell line

has a "hot spot" mutation (codon 248) and expresses only codon 248-mutant p53. SK-MEL-28 has a point mutation at codon 145. SK-MEL-5 cells did not exhibit any p53 mutations, but the absence of p21Waf1 expression suggested functionally aberrant p53. Our data suggest that interaction with Mdm-2 may underlie p53 inactivation in these cells. Using p53 antisense oligonucleotides, we demonstrated a substantial down-regulation of cell surface expression of IGF-IR proteins in all melanoma cell lines after 24 h. This was paralleled by decreased tyrosine phosphorylation of IGF-IR and growth arrest, and, subsequently, massive cell death was observed (this was also seen in BL-41tsp53-2 cells with mutant conformation of ts p53). Taken together, these results suggest that up-regulation of IGF-IR as a result of expression of aberrant p53 may be important for the growth and survival of malignant cells.

4. **Bartolazzi, A.**, Gasbarri, A., Papotti, M., Bussolati, G., Lucante, T., Khan, A., Inohara, H., Marandino, F., Orlandi, F., Nardi, F., Vecchione, A., Larsson, O., and the Thyroid Cancer Study Group. (2001). Application of an immunodiagnostic method for improving the preoperative diagnosis of nodular thyroid lesions. The Lancet 357: 1644-50.

This is the first important International multicentre study, proposed and co-ordinated by the applicant, in which the galectin-3 expression analysis was performed retrospectively on 1006 well-characterized histological thyroid samples. This study was organized and performed by the applicant at Karolinska Hospital, Stockholm, Sweden and involved two Italian Thyroid Centers in Rome and Turin, a Thyroid Institute in Osaka (Japan) and the University of Massachusetts, Boston, USA. The statistical analysis demonstrated that galectin-3 test method had a sensitivity and specificity of 94% and 98% respectively, in detecting thyroid cancer preoperatively, with PPV 98%, NPV 94% and a diagnostic accuracy of 96%. The rationale and the potential application of galectin-3 expression analysis in the preoperative evaluation of thyroid nodules were finally demonstrated.

5. Sjolín H., Tomasello E., Mousavi-Jazi M., **Bartolazzi A.**, Vivier E., Karre K., and Cerboni C. (2002): Pivotal role of KARAP/DAP12 adaptor molecule in the natural killer cell-mediated resistance to murine cytomegalovirus infection. J. Exp. Med. 195:825-834.

Natural killer (NK) cells are major contributors to early defense against infections. Their effector functions are controlled by a balance between activating and inhibiting signals. To date, however, the involvement of NK cell activating receptors and signaling pathways in the defense against pathogens has not been extensively investigated. In mice, several NK cell activating receptors are co-expressed and function through the immunoreceptor tyrosine-based activation motif (ITAM)-bearing molecule KARAP/DAP12. Here, we have analyzed the role of KARAP/DAP12 in the early antiviral response to murine cytomegalovirus (MCMV). In KARAP/DAP12 mutant mice bearing a nonfunctional ITAM, we found a considerable increase in viral titers in the spleen (30-40-fold) and in the liver (2-5-fold). These effects were attributed to NK cells. The formation of hepatic inflammatory foci appeared similar in wild type and mutant mice, but the latter more frequently developed severe hepatitis with large areas of focal necrosis. Moreover, the percentage of hepatic NK cells producing interferon gamma was reduced by 56 +/- 22% in the absence of a functional KARAP/DAP12. This is the first study that shows a crucial role for a particular activating signaling pathway, in this case the one induced through KARAP/DAP12, in the NK cell-mediated resistance to an infection. Our results are discussed in

relation to recent reports demonstrating that innate resistance to MCMV requires the presence of NK cells expressing the KARAP/DAP12-associated receptor Ly49H.

6. Girnita A, Girnita L, del Prete F, **Bartolazzi A**, Larsson O, Axelson M. (2004). Cyclolignans as inhibitors of the insulin-like growth factor-1 receptor and malignant cell growth. Cancer Res. 64:236-42.

The insulin-like growth factor-1 receptor (IGF-1R) plays a pivotal role in transformation, growth, and survival of malignant cells, and has emerged as a general and promising target for cancer treatment. However, no fully selective IGF-1R inhibitors have thus far been found. This is explained by the fact that IGF-1R is highly homologous to the insulin receptor, co-inhibition of which may cause diabetic response. The receptors are both tyrosine kinases, and their ATP binding sites are identical, implying that ATP inhibitors cannot discriminate between them. Therefore, the current strategy has been to identify compounds interfering with receptor autophosphorylation at the substrate level. In this study we investigated the effects of cyclolignans and related molecules on IGF-1R activity. We report that certain cyclolignans are potent and selective inhibitors of tyrosine phosphorylation of the IGF-1R. Of particular interest was picropodophyllin (PPP), which is almost nontoxic (LD (50) >500 mg/kg in rodents). PPP efficiently blocked IGF-1R activity, reduced pAkt and phosphorylated extracellular signal regulated kinase 1 and 2 (pErk1/2), induced apoptosis in cultured IGF-1R-positive tumor cells, and caused complete tumor regression in xenografted and allografted mice. PPP did not affect the insulin receptor or compete with ATP in an in vitro kinase assay, suggesting that it may inhibit IGF-1R autophosphorylation at the substrate level. This is also in agreement with our molecular model of how the cyclolignans may act on the IGF-1R kinase. These results open the possibility to use PPP or related compounds with inhibitory effects on IGF-1R as lead compounds in development of anticancer agents.

7. Papotti M, Rodriguez J, Pompa RD, **Bartolazzi A**, Rosai J. (2005). Galectin-3 and HBME-1 expression in well-differentiated thyroid tumors with follicular architecture of uncertain malignant potential. Mod Pathol. 18:541-6.

Well-differentiated encapsulated tumors of the thyroid gland with a follicular architecture may cause diagnostic difficulties. Questionable vascular or capsular penetration may raise the possibility of a follicular carcinoma, while focal nuclear clearing and grooves may suggest a diagnosis of papillary carcinoma. A proposal was made to designate cases showing suggestive but not conclusive morphological evidence of malignancy along these lines as well-differentiated or follicular tumors of uncertain malignant potential. The aim of the present study was to investigate the expression and diagnostic role in well-differentiated or follicular tumors of uncertain malignant potential of Galectin-3 and HBME-1, two malignancy-related markers. A total of 21 tumors fulfilling the criteria of well-differentiated or follicular tumors of uncertain malignant potential were collected from two institutions, including eight cases with questionable vascular and/or capsular invasion and 13 cases with some degree of nuclear changes in the form of clearing, grooves, and/or pseudo inclusions. Tumors in the first group expressed HBME-1 and Galectin-3 focally (less than 25% of tumor cells) in 5/8 and 3/8 cases, respectively, with 62.5% of cases reacting for at least one marker. Cases in the second category expressed HBME-1 and Galectin-3 in 9/13 and 10/13 cases, respectively, with 92.3% of cases having at least one marker expressed. These findings indicate that HBME-1 and Galectin-3 are heterogeneously distributed

in these borderline tumors, but that a strong and diffuse expression of HBME-1 and to a lower extent of Galectin-3 was preferentially observed in the group characterized by nuclear changes which were similar but less developed than those of conventional papillary carcinoma. The relationship found between the markers investigated and these nuclear changes suggest that the tumors containing them are pathogenetically linked to papillary carcinomas.

8. B. Cecchinelli, L. Lavra, C. Rinaldo, S. Iacovelli, A. Gurtner, A. Gasbarri, A. Ulivieri, F. del Prete, M. Trovato, G Piaggio, A. Bartolazzi,* S. Soddu, & S. Sciacchitano. (2006). Repression of the antiapoptotic molecule Galectin-3 by homeodomain-interactin protein kinase 2-activated p53 is required for p53-induced apoptosis. Mol Cell Biol 26:4746-57. (* Corresponding author). Here we show that p53-induced apoptosis is associated with transcriptional repression of Gal-3. Previously, it has been reported that phosphorylation of p53 at Ser46 is important for transcription of proapoptotic genes and induction of apoptosis and that homeodomain-interacting protein kinase 2 (HIPK2) is specifically involved in these functions. We show that HIPK2 cooperates with p53 in Gal-3 repression and that this cooperation requires HIPK2 kinase activity. Gene-specific RNA interference demonstrates that HIPK2 is essential for repression of Gal-3 upon induction of p53-dependent apoptosis. Furthermore, expression of a nonrepressible Gal-3 prevents HIPK2- and p53-induced apoptosis. These results reveal a new apoptotic pathway induced by HIPK2-activated p53 and requiring repression of the antiapoptotic factor Gal-3.

9. Bartolazzi A, Orlandi F, Saggiorato E, Volante M, Arecco F, Rossetto R, Palestini N, Ghigo E, Papotti M, Bussolati G, Martegani MP, Pantellini F, Carpi A, Giovagnoli MR, Monti S, Toscano V, Sciacchitano S, Pennelli GM, Mian C, Pelizzo MR, Rugge M, Troncone G, Palombini L, Chiappetta G, Botti G, Vecchione A, Bellocco R; Italian Thyroid Cancer Study Group (ITCSG). (2008). Galectin-3-expression analysis in the surgical selection of follicular thyroid nodules with indeterminate fine-needle aspiration cytology: a prospective multicentre study. The Lancet Oncol. 9(6): 543-9. Epub 2008 May 19.

This is the prospective multicentre study, in which galectin-3 test method was finally validated for the clinical use. This study, proposed and co-ordinate by the applicant was carried out at National level and involved 11 Italian Thyroid Institution and 465 patients bearing thyroid proliferations classified as Thy3 at conventional cytology (according to the British Thyroid Association) and than referred to surgery. The galectin-3 test-method was applied to all the lesions on FNA-derived cellblocks, before surgery. Histological diagnosis was considered as the gold standard. A central blind review of histological diagnosis was performed by two independent pathologists (J. Rosai and V. LiVolsi). The statistical analysis demonstrated a sensitivity and specificity of 78% and 93% respectively, PPV 82%, NPV 91% and a diagnostic accuracy of 88%. A diagnostic kit for galectin-3 test method becomes commercially available.

10. Bartolazzi A, D'Alessandria C, Parisella MG, Signore A, Del Prete F, Lavra L, Braesch-Andersen S, Massari R, Trotta C, Soluri A, Sciacchitano S, Scopinaro F. (2008). Thyroid cancer imaging in vivo by targeting the anti-apoptotic molecule galectin-3. PLoS ONE. 3(11): e3768. Epub 2008 Nov20.

In this paper, the applicant proposed a new idea for thyroid cancer imaging in vivo, by using a galectin-3 based radio-immunoscintigraphy. Conventional thyroid scintigraphy with iodine, does

not provide biological information on thyroid nodules but only functional information related to the iodide uptake (cold or hot nodules). By using galectin-3 positive thyroid cancer xenografts in nude mice, we demonstrated that a ⁹⁹Tc radio labeled mAb to galectin-3 provides in vivo imaging of thyroid cancer when injected intravenously in xenografted mice. The galectin-3 based radio-immunoscintigraphy provides biological information about thyroid nodules and represents a useful guide to correctly identify those thyroid proliferations that should be cytologically evaluated and/or promptly excised. The possibility to apply this method for imaging and treatment of other galectin-3 expressing tumors seems also realistic. If the proposed diagnostic approach will prove successful a targeted radio-ablation of galectin-3 expressing tumors might also be explored by using galectin-3 specific mAbs conjugated to different radio compounds (i.e. ¹⁸⁶Re, ¹⁷⁷Lu or ⁹⁰Y, ⁶⁴Cu, ⁶⁷Cu). (Patented).

*Very recently an immunoPET strategy for thyroid cancer imaging in vivo has been developed by our group see: D'Alessandria C, Braesch-Andersen S, Bejo K, Reder S, Blechert B, Schwaiger M, **Bartolazzi A.** Noninvasive In Vivo Imaging and Biologic Characterization of Thyroid Tumors by ImmunoPET Targeting of Galectin-3. Cancer Res. 2016 Jun 15;76(12):3583-92. doi: 10.1158/0008-5472.CAN-15-3046. Epub 2016 May 23. (a second paper on J Nuclear Medicine is in press 2018)*

Other scientific merits

- November, 1998: Winner of “Piero Trivella Award” from Associazione Oncologica Pisana for Research Activity.

- U.I.C.C. (International Union Against Cancer), Yamagiwa-Yoshida Award. 1999

- Since 2001 Life Member of UICC “International Union against Cancer”

International Congress Organizer: Highlights of Thyroid Cancer Pathology and Molecular Biology (Invited speakers and Moderators: Bussolati G., Papotti M., LiVolsi V., Rosai J., Sobrinho Simoes M., Volante M, Bartolazzi A., Sciacchitano S., Nikiforov Y., Tallini G., Fusco A., Santoro M.) Sala della Protomoteca in Campidoglio, February 13th 2009, Rome, Italy.

- President of the 68th session of the WHO regional Committee for Europe Rome, Italy 17-20 September 2018

- Credits from the Italian Minister of Public Health, Work and Social Politics for the Clinical and Scientific activities on Thyroid Cancer Rome, February 13th, 2009

- **Since year 2000:** Member of the Commission of experts for evaluation of EU grants applications (Ref: EE1998 1B02438) (on call).

- **Patent**

Anticorpi monoclonali anti-galectina-3 radio marcati per visualizzazione e radio ablazione in vivo di tumori galectina-3 positivi

Inventor: Armando Bartolazzi

Co-inventors: Francesco Scopinaro

Alberto Signore

Rome February 2nd 2008, Patent. N. RM2008A000097

***** From February 2015 listed on TIS –Top Italian Scientists - Via-Academy
<http://www.via-academy.org> *****

Scientific collaboration and external research grants

External grants for Research

Present Research Group:

Armando Bartolazzi, MD, PhD (P.I.)

Salvatore Sciacchitano MD, PhD,

Luca Lavra MD,

Alessandra Ulivieri

Fabrizio Del Prete, Techn.

Fabio Socciaelli MD, Pathologist (Karolinska Institute)

Calogero D'Alessandria PhD, (Techniska University, Munchen, Germany)

Niccolò Noccioli MD

Giorgia Scafetta PhD

Grants and awards:

i) Recipient of grants from the National Research Council (CNR):

1995 (L. 29 millions.....about 16.000 EURO)
1996 (L. 35 millions.....about 19.000 EURO)

ii) Recipient of grants from Italian Association for Cancer Research (AIRC) with International peer-review:

1995 (L. 40 millions..... about 22.000 EURO)
1996 (L. 45 millions.....about 25.000 EURO)
1997 (L. 45 millions.....about 25.000 EURO)
1998 (L.160 millions.....about 85.000 EURO)
1999 (L.140 millions.....about 72.000 EURO)
2000 (L.120 millions.....about 62.000 EURO)
2003 45.000 EURO)
2005..... 40.000 EURO)
2006..... 40.000 EURO)
2007.....120.000 Euro)
2008 40.000 euro

iii) Recipient of grants from the Italian NIH (National Institute of Health:

1999, (about 16.000 EURO total).

iv) U.I.C.C. (International Union Against Cancer), Yamagiwa-Yoshida Award.

1999 (about 10.000 EURO).

v) Recipient of a grant from Swedish Cancer Fonden, for Guest Researcher, 2000-2001. (About 30.000 EURO /total)

vi) KIs Medicinska fakulteter financial support for research, year 2000-2001, (Sweden) (about 8000 EURO total).

vii) Ragnhild och Einar Lundstroms Minne: Application March, 2000 (Sweden) (10.000 EURO).

viii) Compagnia di San Paolo 207.000 EURO (Italy), 2003-2006.

ix) Italian Ministry of Public Health 11.000 EURO 2004

x) Research Grant from the German Cancer Society in collabotation with Techniska University Munchen, Germany about 400.000 euro (2015-2017)

Six National competitions as *project leader* in the past 10 years four of which founded by Italian Cancerfonden (AIRC) (with International peer review) 2005-2008, one from Compagnia di San Paolo (four years grant 2003-2006); one out of five failed (2004).

International competition as *joint applicant* in the past five years:

(xi) joined project with *Techniska University Munchen, Germany* for thyroid cancer imaging in vivo via galectin-3 immunotargeting

One National competition as *joint applicant* founded by the Italian Ministry of Public Health (2004)

National and International collaborative projects:

i) By the applicant an **International Multicentre Study** entitled: *Galectin-3 and CD44v6 isoforms in the preoperative evaluation of thyroid nodules*, in which a new immunodiagnostic method for thyroid nodules has been validated (1999-2001). Participants: (Italy, USA, Japan, Sweden) (The applicant was the proponent and co-ordinator, see The Lancet 357: 1644-50, 2001).

ii) *Structural and functional characterization of SYT and SSX proteins, and SYT-SSX fusion protein in synovial sarcoma and other tumor malignancies. (Since 1999)*

Collaboration with Prof. Olle Larsson, Cellular and Molecular Tumor Pathology, Cancer Center Karolinska CCK R8:04, Karolinska Hospital, Stockholm, Sweden 1999-2001 (see Cancer Res. 62:3861-3867; Modern Pathology 15:679-685) .

iii) By the applicant a **National (Italian) Prospective Multicentre Study entitled: From the bench to the bedside: galectin-3 Thyrotest for improving the diagnostic accuracy of conventional thyroid FNA cytology**. Supported from Compagnia di San Paolo (2002-2006).

The aims of this translational study were: validation for the clinical use of a new diagnostic test-method for the preoperative characterization of thyroid nodules and definition of the clinical and therapeutic guidelines for patients bearing thyroid nodules.

15 Italian University Hospitals and more than 60 Medical Doctors, Biologists and Scientists were involved (The applicant played as proponent and study co-ordinator, see The Lancet Oncology 9(6): 543-9. Epub 2008 May 19th).

iv) By the applicant: **Development of radiolabeled galectin-3 mAbs for in vivo imaging of thyroid tumors (since January 2005)**. Collaboration with Prof. Francesco Scopinaro Dept. of Nuclear Medicine University La Sapienza, Rome, and Prof. Alessandro Soluri, Dept of Physic at

the National Research Council, Rome. (A. Bartolazzi proponent and study coordinator, see PLoS ONE. 3(11):e3768. Epub 2008 Nov20th).

v) Evolution of the aforementioned project and development of immunoPET strategy for thyroid cancer imaging *in vivo* by targeting galectin-3. **Joint International project** with *Techniska University Munchen, Germany; Mabtech Solna, Sweden* (Armando Bartolazzi, Calogero d'Alessandria; Mark Schwaiger, and Stern Braessh-Andersen) *Italy-Germany-Sweden* Cancer Res. 2016 Jun 15;76(12):3583-92. doi: 10.1158/0008-5472.CAN-15-3046. Epub 2016 May 23. (the applicant is the proponent of the study and International active partner) January 2006- running project). *****

vi) Collaboration with University of Rome Tor Vergata Department of Bio-Engineering (prof. Arnaldo D'Amico, Prof. Giorgio Pennazza, Prof. Corrado Di Natale) **Application of sensor microarrays in the clinical practice. Lung Carcinoma and Melanoma diagnosis.** (The applicant is responsible of the biological and medical part of this study) January 2006- running project). Sci Rep. 2015 Aug 25;5:13246. doi: 10.1038/srep13246.

vii) By the applicant: **Galectin-3 mediated molecular interactions in NSCLC (since January 2008).** Collaboration with Prof. Rolf Lewensohn KBC Karolinska Hospital Solna.

The aberrant expression of galectin-3 in tumor cells has been demonstrated to be critical for the resistance to chemotherapy in several tumor models. Experiments of galectin-3 transfection in thyroid and breast carcinoma cell lines demonstrated that cells expressing galectin-3 are less sensitive to specific chemotherapy. Our preliminary results on NSCLCs tissue microarrays, obtained in collaboration with Rolf Lewensohn 's group at KBC, Karolinska Institute, Stockholm, Sweden, demonstrate that about 50% of Lung adenocarcinomas and squamous cell carcinomas express this molecule.

Considering the fact that no efficient chemotherapy treatment for NSCLCs is currently available, we think that this tumor model represents a good target for studying the biological effects mediated by galectin-3. In this project that will be articulated in different tasks we want to investigate the biological significance of galectin-3 expression in these lesions by using *in vivo* and *in vitro* experimental models with the aim to demonstrate the potential prognostic value of this marker and eventually a biological rationale for a molecular targeted therapy.

(The applicant is the proponent and responsible of this specific study) January 2008- running project).

viii) **St. Andrea Melanoma Working Group (SAMWG).** Since January 2008 the applicant created a multidisciplinary working group on melanoma at St. Andrea Hospital, in which basic scientists, oncologists, dermatologists and pathologists interact each other.

Lab meetings, seminars and clinical rounds are organized twice for month at the Department of Pathology. Meetings and seminars are open to the Medical students, residential students and

Ph.D. students. Potential research projects, thesis and Ph.D programs are considered, discussed and assigned after a multidisciplinary evaluation).

Evaluation of others' work

- **Appointments as an expert for the judgement of applications for academic positions** (one time for Karolinska Institute) year 2002

- **Boards of International scientific evaluation committees** (European Commission since year 2000)

- **Referee duties for research applications at an international level**

Since year 2000: Member of the Commission of experts for evaluation of EU grants applications (Ref: EE1998 1B02438) (on call)

- **Referee duties for research applications at a national level.**

Occasional role as referee for the Italian Association for Cancer Research fellowships

- **Work as an external opponent for PhD thesis (International Institutions) :**

Karolinska Institute, Stockholm, Sweden, and Gronigen University, Netherland

- **Editor of scientific journals and referee for scientific journals.**

Referee activity

The Lancet; Cancer Research; Journal of Clinical Oncology; International Journal of Cancer; American Journal of Pathology; European Journal of Cancer; British Journal of Cancer; British Journal of Dermatology; PLoS One; Thyroid; Journal of Endocrinology Investigation; Molecular Endocrinology; Histopathology; Journal Biological Chemistry; Journal of the American Academy of Dermathologists (JAAD); Others.....

Member of Journals' Editorial Board

Rare Tumors

Guest Editor: **International Journal of Molecular Sciences** : special issue.

Collaboration with the community

Participation in pharmaceutical evaluation / recommendations, pharmaceutical committee work. 1988: Participation in several commissioned studies for characterization of mAbs to be used in clinical practice (i.e. immunohistochemistry, immunoscintigraphy etc...). (Contracts Legge 46, NIH-Industry, Sorin Biomedica).

Field visits and information to non-professionals

November, 8th 1998: National day Against Cancer (organized by the Italian Association for Cancer Research). All the Italian Institutions for Cancer Research were opened to the public. The applicant was selected as Italian researcher to present his research program in a half day meeting.

Mass-Media citations, Articles in National, International newspapers and on-line, in which the applicant's research achievements are mentioned.

1. Strategia in quattro fasi per battere il cancro. Tiroide. *Corriere della Sera* (Italian newspaper) May 31th, 2001
2. Tiroide: E' Italiana una nuova tecnica di diagnosi. Noduli svelati. *Corriere Salute* (Suppl. *Corriere della Sera*), October 21st 2001.
3. Nytt test hittar sköldkörtelcancer. *Dagens Medicin.*, Tisdag 12 Juni 2001, (Sweden)
4. New test may reduce Unnecessary surgeries on noncancerous thyroid tissues. Top stories of July , July 23th , 2001. *American Cancer Society web-site*.
5. Tiroide: La verita' sul nodulo. (Info/salute 2) *Io Donna* (Suppl. *Corriere della Sera*) December 1st, 2001.
6. Cancro alla tiroide, basta un test. **Il Tempo** (Italian newspaper) February, 12th, 2002.
7. Tumori alla Tiroide, un marker li "vede" prima. **Repubblica (inserto salute)** (Italian newspaper) March 7th, 2002
8. Innovativa diagnosi per le lesioni follicolari. Due Guardie per la Tiroide. **TEMPO MEDICO** n.713, 27 Settembre, 2001

9. **TG3-RAI, Italian Television, Interview, February 2002.**

Galectin-3 thyrotest for the preoperative diagnosis of thyroid cancer

10. Un test per scoprire il tumore alla tiroide. **Il Giornale di Napoli** (Italian newspaper) December 11th, 2002

11. Noduli alla tiroide: sempre piu' concreta la possibilita' di una diagnosi precoce non invasiva. **Salute Europa. News**, 19-11-2004

12. **RAI-1, UnoMattina. Italian Television, Interview**, The electronic nose in oncology. 18 September, 2007.

13. Scoperta Italiana per la diagnosi del tumore alla tiroide
Salute Europa News 11/9/2008.

14. Scoperta Italiana per la diagnosi del tumore alla tiroide
Italia Salute.it 18/10/2008.

15. Tiroide, un test per evitare interventi superflui.
Corriere della Sera – Sportello Cancro 19 May, 2008.

16. No more unnecessary surgery for thyroid nodules
AllinfoDir Health Articles and News May 19th, 2008.

17. Gene test may improve thyroid cancer diagnosis.
Medical News May 19th, 2008.

18. Test could improve diagnosis of thyroid nodules.
Modern Medicine May 20th, 2008.

19. New thyroid nodule test could significantly reduce unnecessary surgeries. **eCancer.tv** May 18th, 2008.

20. Analisis de presencia de galectina-3 puede eliminar ciertas intervenciones. **Yahoo Mexico Noticias**. Mayo 18th, 2008.

21. Galectin-3 test could decrease the number of unnecessary surgical procedures. **EUREKALERT** May 18th, 2008.

22.... Other during the recent years.....

PEDAGOGICAL PORTFOLIO

Approved by the Board of Research, January 1st 2008
Karolinska Institute

ARMANDO BARTOLAZZI M.D., Ph.D.

September 2018

Teaching experience

The following section documents teaching experience within:

(1) Undergraduate studies

1997-99: - Professor of Histology and Anatomy, School for Registered nurses, at the NCI Regina Elena of Rome and University "La Sapienza" of Rome, Italy (30 students /year, 20% time work, full responsibility of the course, fully independent).

2001-2006: Adjunct Professor of Histopathology, University School for Technicians of Biomedical Laboratory, University La Sapienza, Sant'Andrea Hospital, Rome, Italy (15-18 students/year) (30% time work, full responsibility of the course, fully independent).

Type of activities: lectures, postgraduate courses, seminars, demonstrations, laboratory supervision.

The applicant was also component of the examination committee at the end of each Academic Year. (Oral and written examination).

(2-3) Postgraduate studies

Postgraduate teaching and Specialist training

2001-present: -*Adjunct Professor of Surgical Pathology for the Residential Course in Surgical and Anatomic Pathology*, St. Andrea University Hospital, University La Sapienza, Rome, Italy (30% time work. full year, co-responsibility).

2001-2010: -*Adjunct Professor of Surgical Pathology for the Residential Course in Dermatopathology*, St. Andrea University Hospital, University La Sapienza, Rome Italy (30% time work, Full year, full-responsibility).

2002-2006: - *Adjunct Professor of Surgical Pathology for Medical Students* (Pathology of the Endocrine diseases). St. Andrea University Hospital, University La Sapienza, Rome, Italy (more than 80-100 students/year). (10% time work, Full year, full-responsibility).

2002-2006: - *Adjunct Professor of Surgical Pathology for Medical Students* (Pathology of the Skin and Plastic Surgery). St. Andre University Hospital, University La Sapienza, Rome Italy (more than 80-100 students/year). (10% time work, Full year, full-responsibility).

Type of activities: lectures, graduate courses, seminars.

The applicant is also component of the examination committee at the end of each Academic Year (oral and practical examination)

Supervision of doctoral candidates/postgraduate education

Chief Supervisor for 10 Ph.D. and M.D. graduated at National and International levels

Since 2002 Co- Supervisor of PhD students and post-graduated students at national and international level (26 Doctors)

Trainer Activity and supervision for undergraduate students and technicians

Participation in teacher exchange for lecturing at foreign universities

Competence as docent. (Date and subject/speciality)

- M.D. degree (1997). University La Sapienza, Rome, Italy.
- Specialist degree in Clinical and Experimental Oncology (28/10/1991). University La Sapienza, Rome, Italy.
- Specialist degree in Histology and Anatomic Pathology (24/11/1999). University La Sapienza, Rome, Italy.

Text books (book's chapters for Medical doctors, and Specialists in Oncology and Surgical Pathology)

1. Conti, EMS., Bartolazzi, A., Diotallevi, F., Crespi, M. (1987). Lineamenti di epidemiologia del carcinoma dell'endometrio. XIII Congresso Nazionale di Oncologia (S.I.P.D.T.) - I tumori dell'utero, dell'ovaio e della vulva- Monduzzi Edit. Vol. 1: pp. 461-473
2. **Bartolazzi, A.**, Mottolese, M., Prat, M., Vocaturo, A., Vocaturo, G., Atlante, G., Natali, PG. (1990). Potenziale immunodiagnostico degli AcMo AR-3 e B72.3 nel carcinoma dell'endometrio. - Atti della societa' Italiana di Ginecologia ed Ostetricia. - Class International Edition. Brescia
3. Natali, PG., Mottolese, M., Venturo, I., Salzano, M., Bartolazzi, A., **Perrone** Donnorso, R., Bigotti, A. (1990). Improvement of cytodiagnosis of solid tumors using a panel of monoclonal antibodies. In: Biological response modifiers. Application in clinical medicine. Indivieri, F., Puppo, F., Sudelletti, M.: Editors, pp. 314-323. Esculapio Bologna

4. Parisi, A., Bartolazzi, A., Bonino, C., Camagna, M., De Monte, LB., Lombardi, A., Natali, PG., Paganelli, G., Tarditi, L., Vassarotto, C., Malavasi, F. and Mariani, M. (1992). BIS-1: a novel bispecific monoclonal antibody for CEA-expressing carcinoma radioimmunoscinigraphy and radioimmunotherapy. - In: New generation of monoclonal antibodies in diagnosis and therapy. Biotech RIA (Karger ed.)

* 5. **Bartolazzi, A.** (1999): CD44 ed acido ialuronico nella crescita e progressione neoplastica. *In*: Giavazzi, R., Lollini, PL., Bevilacqua, G. Invasione e metastasi Ed. da Pacini Editore; pp. 57-75.

* 6. Natali, PG, **Bartolazzi, A.** (1999). : Le molecole di adesione nella fisiopatologia della crescita e della progressione del melanoma cutaneo.. *In*: Giavazzi, R., Lollini, PL., Bevilacqua, G. Invasione e metastasi Ed. da Pacini Editore; pp. 207-222.

7. **Bartolazzi, A** (2004): Thyroid Fine Needle Aspiration Cytology. In Encyclopedia of Endocrinology and Endocrine Diseases. L. Martini Editor, Academic Press San Diego, CA, USA.

8. **Bartolazzi, A** (2009):. Non-small cell lung carcinoma: EGFR gene mutations and response to gefitinib. In Methods of Cancer Diagnosis, Therapy and Prognosis. M.A. Hayat Editor, Springer 1020 pgg.

9. **A. Bartolazzi**, Thyroid Fine Needle Aspiration Cytology. update to **B0-12-475570-4.01286-5 ELSEVIER INC**, 225 Wyman Street, Waltham, MA 02451, United States. Online Reference Database in **Biomedical Sciences** (2015 in press).

10) A. Bartolazzi and co-authors : Follicular thyroid Cancer. In WHO Blue Books 4th Edition WHO Classification of Tumors of Endocrine Organs. World Health Organization (Lyon Cedex DB, France) – (in press 2016) **(International reference for pathologists commissioned by the World Health Organization)**

- *The mentioned book's chapters are directed to specialists in Oncology and Pathology, which are interested to the clinical application of mAbs.*

* *These works, were commissioned by the Italian working group "invasion and metastasis", which is a sub-group of the Italian Cancer Society. These works are directed to medical students, specialists and researchers that are interested in studying the molecular mechanisms involved in tumor growth and progression. (Fully compiled by the applicant).*

RESEARCH AND DEVELOPMENTAL WORK

The applicant has been appointed as Professor of Histology and Anatomy at the University School for Registered Nurses also for the Academic Year 1999-2000, but he released this assignment because involved in a research project in Sweden.

During the previous year he introduced a new teaching program for this course. In the second half of the course each student had the responsibility to compile a detailed thesis on selected organ and/or apparatus, which was evaluated by the teacher. After evaluation, each student was invited to present his own work to the class fellows in form of "seminar".

In this manner the teaching program has been always completed and students were facilitated to interact each other on scientific issues. The questionnaire for the final evaluation was prepared on the bases of the work presented by the students.

Development work within postgraduate studies, M.D, Ph: D., and Specialists

St. Andrea Melanoma Working Group (SAMWG). Since January 2008 the applicant created a multidisciplinary working group on melanoma at St. Andrea Hospital, in which basic scientists, oncologists, dermatologists and pathologists interact each other.

Lab meetings, seminars and clinical rounds are organized twice for month at the Department of Pathology. Meetings and seminars are opened also to the Medical students, residential students and PhD students. Potential research projects, thesis and PhD programs are considered and discussed and assigned after a multidisciplinary evaluation.

7. Honours and assessments of pedagogical work (n.a.)

11 Other distinctions/honours

- 1) U.I.C.C. (International Union Against Cancer), Yamagiwa-Yoshida Award.
1999
- 2) Since 2001 Life Member of UICC “International Union against Cancer”
- 3) President of the 68th session of the WHO regional Committee for Europe
Rome, Italy 17-20 September 2018

CLINICAL PORTFOLIO

Approved by the Board of Research, January 1st 2008
Karolinska Institute

ARMANDO BARTOLAZZI M.D., Ph.D.

September 2018

Clinical competence and formal training

Completed clinical training documented through specialist competence.

10/04/1987: M.D. Degree University "La Sapienza", Rome, Italy, (summa cum laude)

1987: M.D. licence, University "La Sapienza", Rome, Italy.

- Internship in Internal Medicine, (1987-1988), I° Clinica Medica Policlinico Umberto I, University "La Sapienza", Rome, Italy.

-1988: General Doctor USL/Roma 3, June1988-July1988, with full responsibility for more than 100 patients.

1999- Specialist Degree in Histology and Anatomic Pathology (1994-1999), with final thesis and Diploma (*summa cum laude*). University "La Sapienza" of Rome, Italy (Title: Galectin-3 and Thyroid Cancer).Roma 24-11-1999

1991: Specialist Degree in Clinical and Experimental Oncology and **Ph.D. program** (1987-1991) with final dissertation and Diploma (*summa cum laude*). National Cancer institute Regina Elena Rome, IRCCS and University "La Sapienza", Rome, Italy (Title: Production and characterization of monoclonal antibodies to V α -3 integrin).- Roma 28-10-1991

Number of years as specialist, and experience in inpatient and outpatient care.

The applicant worked *since 1991 as specialist in Oncology* in particular in the area of diagnosis and follow-up of cancer patients. (Outpatient care).

From December 1993 to October 2001: *Assistant Professor of Pathology* at the National Cancer Institute Regina Elena of Rome (permanent position). (40.000 histological slides/year, 9000 intra-operative diagnosis/year for five pathologists at the Department - Two years work experience (1994-95) were matured at the Cytology Department. (Inpatient and outpatient care)

January 1997- March 99: *designed pathologist* for the multi-disciplinary clinical and experimental working group on Breast Cancer (600 cases/year) at the National Cancer Institute, Regina Elena of Rome. (Inpatient and outpatient care)

January 1997- March 99: *designed pathologist* for the multi-disciplinary clinical and experimental working group on Colon Cancer (180 cases/year) at the National Cancer Institute, Regina Elena of Rome. (Inpatient and outpatient care)

January 1997- March 99: **designed pathologist** for the multi-disciplinary clinical and experimental working group on Melanoma (110 cases/year), at the National Cancer Institute, Regina Elena of Rome. (Inpatient and outpatient care)

January 1996- March 99: **designed pathologist** for the autoptic service at the National Cancer Institute, Regina Elena of Rome.

1996-1998: **Consultant Pathologist** at the General Hospital S.S. Salvatore, (Regional Hospital), USL RM/25 Rome, and Italy. (Inpatient and outpatient care; 5155 histological diagnoses, personally performed).

2001 (three months): **Consultant Pathologist (part time)** for melanoma in collaboration with Prof. Olle Larsson, at Dept. of Oncology-Pathology Karolinska Hospital, Stockholm, Sweden.

Since November 2001-present: Dirigente Primo Livello (Associated Professor of Pathology) Sant' Andrea University Hospital, II° Faculty of Medicine, University La Sapienza, Rome, Italy (about 12.000 histological cases / year) (permanent position) *.

** Since 2003 the applicant got a high specialized profile in thyroid pathology (St. Andrea University Hospital)*

Experience of on-call services

More than 20 years experience of on-call services for intra-operative diagnosis (histological diagnosis on frozen tissue sections)

NCI Regina Elena of Rome and Sant' Andrea University Hospital.

Special Clinical competence/profile area

- Tumor Pathology (subspecialty expertise in Head and Neck Cancer, Thyroid cancer and Skin Cancer including Melanoma).

-Diagnosis in Oncology (clinical and histopathological diagnosis, immunodiagnosis, molecular diagnosis).

-Intra-operative histological diagnosis.

- Autoptic diagnosis.

-Clinical management of cancer patients during the diagnostic phase and follow-up.

-Tumor pathology and tumor physiopathology related problems.

Since 2003 the applicant got a high specialized profile in thyroid pathology at St. Andrea University Hospital (He plays as consultant for many external cases collected at National and International level)

Thyroid Cancer Expert nomination: World Health Organization (Lyon cedex DB, France)
– WHO expert for thyroid Cancer , June 30, 2015

-Translational research in Oncology and Pathology (i.e. 30 years of experience in production, characterization and clinical applications of monoclonal antibodies directed to tumor associated antigens. Some of these reagents are commercially available and routinely used in several National and International Institutions for immunodiagnosis, and differential diagnosis of neoplastic diseases, for characterizing cancers of unknown origin, and for evaluating intra- and post-operatively, the minimal residual disease). Development of galectin-3 thyrotest for preoperative characterization of thyroid nodules (commercially available).

Research projects for tumor imaging *in vivo* based on galectin-3 immunotargeting are running (Collaboration with Technische University of Munchen, Germany and Mabtech Solna, Sweden)

**SPECIFIC CLINICAL AND EXPERIMENTAL ACTIVITIES PERFORMED AT
THE DEPARTMENT OF PATHOLOGY SANT'ANDREA UNIVERSITY
HOSPITAL, ROME**

A.B. is mostly involved in Cancer Diagnosis with specific expertise in Dermatopathology (in particular Skin Cancer and pigmented lesions), Head and Neck pathology (Thyroid, larynx, salivary glands, oral cavity), Soft Tissue Tumors, and several solid tumors. Since 2003 the applicant got a high-specialized profile in thyroid pathology

3 Clinical development work

- **Development/establishment/evaluation of new treatment strategies.**

The applicant matured many years of experiences in production and characterization of mAbs directed to tumor associated antigens with the aim to improve the diagnostic accuracy of conventional cytology and histology in cancer diagnosis.

As reported in the specific scientific portfolio, several of these mAbs are routinely used in National and International Institutions for improving the diagnostic accuracy of conventional cytology and histology for different solid tumors.

i) By the applicant an **International Multicentre Study** entitled: *Galectin-3 and CD44v6 isoforms in the preoperative evaluation of thyroid nodules*, in which a new immunodiagnostic method for thyroid nodules has been proposed (1999-2001). Participants: (Italy, USA, Japan, Sweden) (The applicant was the proponent and study coordinator, see A. Bartolazzi et al. *The Lancet* 357: 1644-50, 2001).

ii) By the applicant a **National (Italian) Prospective Multicentre Study** entitled: *From the bench to the bed side: galectin-3 Thyrotest for improving the diagnostic accuracy of conventional thyroid FNA cytology*. Supported from Compagnia di San Paolo (2002-2006). In this translational study the new diagnostic test-method for the preoperative characterization of thyroid cancer was validated for the clinical use. The clinical and therapeutic guidelines for patients bearing Thy3 thyroid nodules were defined. 15 Italian University Hospitals and more than 60 Medical Doctors, Biologist and Scientists were involved (The applicant played as proponent and study coordinator, see A. Bartolazzi et al. *The Lancet Oncology* 9(6):543-9. Epub 2008 May 19th).

iii) By the applicant: **Development of radiolabeled galectin-3 mAbs for in vivo imaging of thyroid tumors (since January 2005)**. Collaboration with Prof. Francesco Scopinaro Dept. of Nuclear Medicine University La Sapienza, Rome, and Prof. Alessandro Soluri, Dept of Physic at the National Research Council, Rome. (A. Bartolazzi proponent and study coordinator, see PLoS ONE. 3(11):e3768. Epub 2008 Nov20th).) This project has been recently implemented with an

International collaboration with Techniska Univrsity of Munchen, Germany) see Cancer Res. 2016 Jun 15;76(12):3583-92. doi: 10.1158/0008-5472.CAN-15-3046. Epub 2016 May 23. (*patented*)

iv) Collaboration with University of Rome Tor Vergata Department of Bio-Engineering (prof. Arnaldo D'Amico, Prof. Giorgio Pennazza, Prof. Corrado Di Natale) Application of sensor microarrays in the clinical practice. Lung Carcinoma and Melanoma diagnosis. **(The applicant is responsible of the biological and medical part of this study)** Sci Rep. 2015 Aug 25;5:13246. doi: 10.1038/srep13246. (*Running project*).

v) By the applicant: **Galectin-3 mediated molecular interactions in NSCLC (since January 2008)**. Collaboration with Prof. Rolf Lewensohn KBC Karolinska Hospital Solna. The aberrant expression of galectin-3 in tumor cells has been demonstrated to be critical for the resistance to chemotherapy in several tumor models. Experiments of galectin-3 transfection in thyroid and breast carcinoma cell lines demonstrated that cells expressing galectin-3 are less sensitive to specific chemotherapy. Our preliminary results on NSCLCs tissue microarrays, obtained in collaboration with Rolf Lewensohn 's group at KBC tissue, demonstrate that about 50% of Lung adenocarcinomas and squamous cell carcinomas express this molecule. Considering the fact that no efficient chemotherapy treatment for NSCLCs is currently available, we think that this tumor model represents a good target for studying the biological effects mediated by galectin-3.

In this project that will be articulated in different tasks we want to investigate the biological significance of galectin-3 expression in these lesions by using *in vivo* and *in vitro* experimental models with the aim to demonstrate the potential prognostic value of this marker and eventually a biological rationale for a molecular targeted therapy.

(The applicant is the proponent and responsible of this study) January 2008- ***running project***).

- **Development of health-care programmes.**

1997-1999. The applicant contributed to define the Clinical-therapeutic guidelines for Breast Cancer, at the NCI Regina Elena of Rome, Italy.

1997-1999. The applicant contributed to define the Clinical-therapeutic guidelines for Colon Cancer, at the NCI Regina Elena of Rome, Italy.

1997-1999. The applicant contributed to define the Clinical-therapeutic guidelines for Melanoma, at the NCI Regina Elena of Rome, Italy.

2001-2004: The applicant recently contributed to define the clinical and therapeutic guidelines for the management of patients bearing thyroid nodular diseases (National and International Level) (see specific scientific portfolio for detail).

2003: Contribution to define the guidelines for melanoma histological diagnosis (Sant' Andrea Hospital and University La Sapienza – Rome).

LEADERSHIP, DEVELOPMENT AND WORKPLACE RELATIONS PORTFOLIO

Approved by the Board of Research, January 1st 2008

Karolinska Institute

ARMANDO BARTOLAZZI M.D., Ph.D.

September 2018

Leadership positions

1. **Since 1994:** Principal Investigator of an independent research group supported by peer-reviewed grants from different agencies. N.C.I- Regina Elena of Rome (IRCCS) and St. Andrea University Hospital, Rome, Italy. (*See scientific portfolio for details*).

2. **Co-organizer and responsible** of the human tissue bank (frozen biopsies), and cell culture bank at the NCI Regina Elena of Rome.

The availability of this material is strategic for establishing collaborative projects with scientific Institutions interested in mAbs screening, validation of immunochemical tests, identification of tumor associated antigens, production of new mAbs and for creating collaborative research projects with National and International laboratories.

3. **Organizer and coordinator** of an International multicentre study involving U.S.A, Japan, Italy and Sweden, aimed to validate the galectin-3 thyrotest for the pre-operative diagnosis of thyroid cancer. (*see The Lancet 357: 1644-50, 2001 and the scientific portfolio for detail*).

4. **Organizer and coordinator** of a National Multicentre study for transferring in the clinical setting the galectin-3 thyrotest and for defining the clinical-therapeutic guidelines for thyroid nodular diseases. (*see The Lancet Oncology 9(6):543-9. Epub 2008 May 19th and the scientific portfolio for detail*).

5. 1998-2001, Elected member of the Technical and Scientific committee (TSC) at the NCI Regina Elena of Rome, Italy .

6. **St. Andrea Melanoma Working Group (SAMWG).** Since January 2008 the applicant created a multidisciplinary working group on melanoma at St. Andrea Hospital, in which basic scientists, oncologists, dermatologists and pathologists interact each other. (*see the scientific portfolio for details*).

7) By the applicant: **Development of radiolabeled galectin-3 mAbs for *in vivo* imaging of thyroid tumors (since January 2005).** Collaboration with Prof. Francesco Scopinaro Dept. of Nuclear Medicine University La Sapienza, Rome, and Prof. Alessandro Soluri, Dept of Physic at the National Research Council, Rome. (A. Bartolazzi proponent and study coordinator, *see PLoS ONE. 3(11):e3768. Epub 2008 Nov20th*). Recent implementation of the technique, which use an immunoPET strategy for imaging gal-3 positive tumors in vivo- Collaboration with Dr. Calogero D'Alessandria and Markus Schwaiger, Techniska University of Munchen, Germany. Cancer Res. 2016 Jun 15;76(12):3583-92. doi: 10.1158/0008-5472.CAN-15-3046. Epub 2016 May 23.

8) Collaboration with University of Rome Tor Vergata Department of Bio-Engeneering (prof.

Arnaldo D'Amico, Prof. Giorgio Pennazza, Prof. Corrado Di Natale) **Application of sensor microarrays in the clinical practice. Lung Carcinoma and Melanoma diagnosis.** (The applicant is responsible of the biological and medical part of this study). Sci Rep. 2015 Aug 25;5:13246. doi: 10.1038/srep13246 (*running project*).

9) By the applicant: **Galectin-3 mediated molecular interactions in NSCLC (since January 2008).** Collaboration with Prof. Rolf Lewensohn KBC Karolinska Hospital Solna. (The applicant is the proponent and responsible of this study) January 2008- *running project*).

International Congress organiser

- The applicant organized personally the International meeting entitled: *Highlights of thyroid Cancer Pathology and Molecular Biology- Rome, February 13th, 2009*, in a prestigious place "Sala della Protomoteca in Campidoglio provided by the Italian Government. He got financial support from the bank Compagnia di San Paolo and from the Italian Association for Cancer Research. He got also credits from The Italian Ministry of Work and Public Health. Invited speakers and chairman: Gianni Bussolati, Mauro Papotti, Virginia LiVolsi, Juan Rosai, Manuel Sobrinho-Simoes, Marco Volante, Armando Bartolazzi, Salvatore Sciacchitano, Yuri Nikiforov, Giovanni Tallini, Alfredo Fusco, Massimo Santoro.

- President of the 68th session of the WHO regional Committee for Europe Rome, Italy 17-20 September 2018

Head of section, director of studies, programme director, education responsibility.

Organizer and Director of the study described in points 3-4 and 7-9 listed above. Responsibility of the clinical courses already listed in the pedagogical portfolio (*see the specific portfolio for detail*).

Supervisor/lecturer/mentor

Since 1994 The applicant played as supervisor, co-supervisor and mentor for more than 30 Medical students, PhD students, Lab technicians, post-doc and specialists in Pathology and Oncology at University La Sapienza of Rome and at the National Cancer Institute Regina Elena of Rome. (*See specific portfolio for more details*).

3.3 Workplace and social leadership competence

See references below.

5. **1998-2001**, Elected member of the Technical and Scientific committee (TSC) at the NCI Regina Elena of Rome, Italy .

The applicant has full administrative responsibility for the grant and salary of the research group.

- **Building up team-based/multi-disciplinary collaborative clinical projects**

St. Andrea Melanoma Working Group (SAMWG). Since January 2008 the applicant created a multidisciplinary working group on melanoma at St. Andrea Hospital, in which basic scientists, oncologists, dermatologists and pathologists interact each other. (see the scientific portfolio for details).

- **Ability to lead and co-operate with colleagues and other personnel groups within healthcare.**

Specific references for this point can be easily derived by the number of scientific collaborations at National and International level, by organization of multicentre studies successfully concluded, by the number of running projects in collaboration with International Institutions and by the number and quality of publications

(see specific portfolio for details).

3.4 Clinical leadership and co-operation competence.

See the specific points 1 to 6 above

Formal Public Competitions for leader positions

1) Ready to work as Chairman of the Pathology Department, at the National Cancer Institute IST of Genova, Italy. (U.O.C. Director of the Pathology Department) Genova – 19-05-2004. (Prof. Juan Rosai in the evaluation committee).

2) Ready for position of Scientist/researcher project Leader in Biomedicine at Karolinska Institute, Stockholm, Sweden – International competition placed in the top rank (4th out of 33 applicants) – Oslo 20 th May, 2002 (Prof. Jan Carlstedt-Duke).

3) Ready to work as Chairman of the Pathology Department at Karolinska University Hospital, Stockholm, Sweden. International Competition . 3th in the rank (Prof. Peter Collins University of Cambridge; January 23, 2001).

4) Ready for the position of professorship in Tumor Pathology combined with the position as Chief Physician at Karolinska Institute (Full Professor). International competition; 3th in the rank (Prof. Anne-Lise Borresen-Dale; Oslo August 24, 2009).

Strategic competence

To promote translational research programs in oncology and tumor pathology at National and International level.

Innovation experience

- **Patent**

Anticorpi monoclonali anti-galectina-3 radio marcati per visualizzazione e radio ablazione in vivo di tumori galectina-3 positivi

Inventor: Armando Bartolazzi

Co-inventors: Francesco Scopinaro

Alberto Signore

Rome February 2nd 2008, Patent. N. RM2008A000097

Development of products

- Galectin-3 thyrotest (Mabtech, Nacka, Sweden and Space import&export, Milan, Italy), Commercially available.

- Several mAbs to tumor associated antigens and integrin molecules, commercially available.

4.2 Entrepreneurship

Good skills to organize and co-ordinate multicentre studies at National and International level and to collaborate in translational research joint projects. Full independence in grants applications (*see specific portfolio for details*).

Since 2006: Organization, supervision and quality control of the surgical pathology unit, pathology laboratory, Gruppo ARTEMISIA - Roma

5 Workplace relations

The applicant is very well-known for his good workplace relations. He is very open to collaborate with people interested in translational research. Since 1993 the time of his first experience in a foreign laboratory (MGH, Pathology Research Lab., Harvard Medical School, Boston, USA) he keeps excellent relationships with colleagues all around the world. Some of them become very good friends and there are still active collaborations. Specific detail on this issue can be obtained by the previous laboratory's Directors, which know the applicant from many years. Some of them are listed below:

Ada Sacchi Ph.D.,

Chief of the Dept. of Experimental Research, National Cancer Institute Regina Elena of Rome, Director of Molecular biology Laboratory at C.R.S. – I.R.E. via delle Messi d'Oro 156, Rome, Italy. E-mail: Sacchi@ifo.it Phone: +39-06-52661

Pier Giorgio Natali M.D., Ph.D.,

Past Scientific Director of the N.C.I. Regina Elena, Rome, Italy. Director of Immunology Laboratory and Molecular Pathology Lab. at C.R.S. – I.R.E. via delle Messi d'Oro 156, Rome, Italy. E-mail: Natali@ifo.it Phone: +39-06-52661

Olle Larsson M.D., Ph.D., Professor

Professor of Pathology, Chief of the Cellular and Molecular Tumor Pathology Laboratory, Cancer Centre Karolinska, Karolinska Hospital, Stockholm, Sweden.

E-Mail: Olle.Larsson@ki.se

Fax: +46-8-321047

Ivan Stamenkovic M.D., Ph.D, Professor: Past Director of the Molecular Pathology Unit, at MGH, Harvard Medical School, Boston, Usa. Professor of Experimental Pathology, Division of Experimental Pathology, Institute of Pathology, CHUV, Lausanne, Switzerland.
Ivan.Stamenkovic@chuv.hospvd.ch

5.1 Collaboration with the community

Media: Several interviews at the Italian televisions and many citations on the national and international newspapers (*See specific scientific portfolio for detail*)

Community

Participation in exhibitions and popular science events addressed to the general public.

Cancer day, organized by the Italian Association for Cancer Research. The applicant participated since 1994 to public manifestation for promoting Cancer Research in Italy (once for year)

Collaboration with Industry

1988: Participation in several commissioned studies for characterisation of mAbs to be used in clinical practice (i.e. immunohistochemistry, immunoscintigraphy etc.).(Contracts Legge 46, NIH-Industry, Sorin Biomedica).

5.2 Committee work

- Referee duties for research applications at an international level

Since year 2000: Member of the Commission of experts for evaluation of EU grants applications (Ref: EE1998 1B02438) (on call).

1998-2001, Elected member of the Technical and Scientific committee (TSC) at the NCI Regina Elena of Rome, Italy.

5.3 Active work on ethical issues, equal opportunities, the workplace environment and environmental questions:

Since August 2015 the applicant is an active official member of CUG “*Comitato Unico di Garanzia per le pari opportunità, la valorizzazione del benessere di chi lavora e contro le discriminazioni*” at Sant’Andrea University Hospital. Rome, Italy.