

**BIOGRAPHICAL SKETCH**

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NAME: Lúcio José de Lara Santos

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Assistant Professor UFP and (invited)-ICBAS

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	Completion Date MM/YYYY	FIELD OF STUDY
Agostinho Neto University, Angola	MD	12/1985	Medicine
Universidade Nova, Lisboa	MD	10/1989	Medicine
Porto University, Porto	MSc	10/1993	Oncobiology
Portuguese Institute of Oncology, Porto	General Surgery	01/1994	General Surgery license
Portuguese Institute of Oncology, Porto	Surgical Oncology	04/1998	Surgical Oncology fellowship
Porto University, Porto	PhD	05/2003	Surgery and Oncobiology
Porto University, Porto	PostDoc.	05/2006	Experimental pathology and oncology

**A. Personal Statement**

I am a surgeon and clinician scientist performing research on surgical oncology and carcinogenesis. My surgical Oncology expertise is with GI cancer and I am committed with esophageal, gastric hepatobiliary and pancreatic oncology, my research field is experimental pathology and oncology including GI and cancer related with infections.

**B. Positions and Honors****Positions and Employment**

1985 - 1990	Medical Doctor in Angola
1990 – 1994	Portuguese Institute of Oncology – Porto, Portugal (General surgery fellowship)
1994 – 2000	St. George Hospital – Surgical Oncology and Surgical ICU training, Surgical Oncology in Leyden Academies and Portuguese Institute of Oncology – Porto, Portugal - Surgical Oncology Department
2001- 2006	Portuguese Institute of Oncology – Porto, Portugal - Surgical Oncology Department
2007-2012	Portuguese Institute of Oncology – Porto, Portugal. Head of GI Unit of Surgical Oncology Department

2015-present      Head of Experimental Pathology and Therapeutics Group, Research Center,  
Portuguese Institute of Oncology Francisco Gentil, Porto, Portugal;  
Head of Surgical intermediate care Unit Portuguese Institute of Oncology  
Francisco Gentil, Porto, Portugal;

### **Other Experience and Professional Memberships**

1994- present      Member, Portuguese Society of General Surgery, Portugal  
2000- present      Member, European Society of Surgical Oncology , ESO  
2002- present      Member, Portuguese Society of Intensive Care, Portugal  
2004- present      Member, Portuguese Society of General Surgery, Portugal  
2006- present      Member, Portuguese Society of Oncology, Portugal  
2004 – Present Invited Professor of Surgical Oncology of Porto University, Porto, Portugal  
2004 – Professor of Oncology of Fernando Pessoa University , Porto Portugal

### **Honors**

1st prize for research in cancer surgery 1999 (Portuguese Society of General Surgery, Portugal)

### **Contribution to Science:**

#### **Cancer**

- a. Fernandes E, Peixoto A, Neves M, Afonso LP, **Santos LL**, Ferreira JA. Humoral response against sialyl-Le(a) glycosylated protein species in esophageal cancer: insights for immunoproteomic studies Short Communication. Electrophoresis. 2015.
- b. Afonso J, Longatto-Filho A, Martinho O, Lobo F, Amaro T, Reis RM, **Santos LL**. Low RKIP expression associates with poor prognosis in bladder cancer patients. Virchows Arch. 2013 Apr;462(4):445-53.
- c. Pinto C, Veiga I, Pinheiro M, Mesquita B, Jeronimo C, Sousa O, Frago M, **Santos L**, Moreira-Dias L, Baptista M, Lopes C, Castedo S, Teixeira MR. MSH6 germline mutations in early-onset colorectal cancer patients without family history of the disease. Br J Cancer. 2006 Sep 18;95(6):752-6. Epub 2006 Aug 29.
- d. Palmeira CA, Oliveira PA, Seixas F, Pires MA, Lopes C, **Santos L**. DNA image cytometry in bladder cancer: state of the art. Anticancer Res. 2008 Jan-Feb;28(1B):443-50. Review

#### **Carcinogen**

- a. **Santos LL**, et al. Expression of cell-cycle regulatory proteins and their prognostic value in superficial low-grade urothelial cell carcinoma of the bladder. Eur J Surg Oncol. 2003 Feb;29(1):74-80.

- c. Carneiro F, **Santos L**, Sobrinho-Simoes M. Carcinoma arising in gastric hyperplastic polyps. *Gastrointest Endosc.* 1995 Feb;41(2):178-9.
- d. Pina-Cabral L, **Santos L**, Mesquita B, Amaro T, Magalhães S, Criado B. Detection of survivin mRNA in urine of patients with superficial urothelial cell carcinomas. *Clin Transl Oncol.* 2007 Nov;9(11):731-6.

### Antigen

- a. Carneiro F, **Santos L**, David L, Dabelsteen E, Clausen H, Sobrinho-Simoes M. T (Thomsen-Friedenreich) antigen and other simple mucin-type carbohydrate antigens in precursor lesions of gastric carcinoma. *Histopathology.* 1994 Feb;24(2):105-13.
- b. Botelho MC, Vale N, Gouveia MJ, Rinaldi G, Santos J, **Santos LL**, Gomes P, Brindley PJ, Correia da Costa JM. Tumour-like phenotypes in urothelial cells after exposure to antigens from eggs of *Schistosoma haematobium*: an oestrogen-DNA adducts mediated pathway? *Int J Parasitol.* 2013 Jan;43(1):17-26.
- c. Ferreira JA, Videira PA, Lima L, Pereira S, Silva M, Carrascal M, Severino PF, Fernandes E, Almeida A, Costa C, Vitorino R, Amaro T, Oliveira MJ, Reis CA, Dall'olio F, Amado F, **Santos LL**. Overexpression of tumour-associated carbohydrate antigen sialyl-Tn in advanced bladder tumours. *Mol Oncol.* 2013 Jun;7(3):719-31.
- d. Almeida A, Ferreira JA, Teixeira F, Gomes C, Cordeiro MN, Osório H, **Santos LL**, Reis CA, Vitorino R, Amado F. Challenging the limits of detection of sialylated Thomsen-Friedenreich antigens by in-gel deglycosylation and nano-LC-MALDI-TOF-MS. *Electrophoresis.* 2013.

### Gastrointestinal

- a. Veiga I, Silva M, Vieira J, Pinto C, Pinheiro M, Torres L, Soares M, **Santos L**, Duarte H, Bastos AL, Coutinho C, Dinis J, Lopes C, Teixeira MR. Hereditary gastrointestinal stromal tumors sharing the KIT Exon 17 germline mutation p.Asp820Tyr develop through different cytogenetic progression pathways. *Genes Chromosomes Cancer.* 2009 Oct 21;49(2):91-98.
- b. Pinheiro M, Ahlquist T, Danielsen SA, Lind GE, Veiga I, Pinto C, Costa V, Afonso L, Sousa O, Fragoso M, **Santos L**, Henrique R, Lopes P, Lopes C, Lothe RA, Teixeira MR. Colorectal carcinomas with microsatellite instability display a different pattern of target gene mutations according to large bowel site of origin. *BMC Cancer.* 2010; 27;10:587.
- c. Silva M, Veiga I, Ribeiro FR, Vieira J, Pinto C, Pinheiro M, Mesquita B, Santos C, Soares M, Dinis J, **Santos L**, Lopes P, Afonso M, Lopes C, Teixeira MR. Chromosome copy number changes carry prognostic information independent of KIT/PDGFRα point mutations in gastrointestinal stromal tumors. *BMC Med.* 2010; 14;8:26.
- d. Veiga I, Silva M, Vieira J, Pinto C, Pinheiro M, Torres L, Soares M, **Santos L**, Duarte H, Bastos AL, Coutinho C, Dinis J, Lopes C, Teixeira MR. Hereditary gastrointestinal stromal tumors sharing the KIT Exon 17 germline mutation p.Asp820Tyr develop through different cytogenetic progression pathways. *Genes Chromosomes Cancer.* 2010 Feb;49 (2):91-8.

### Tumors

- a. Santos L, et al. Neovascularisation is a prognostic factor of early recurrence in T1/G2 urothelial bladder tumours. *Ann Oncol.* 2003 Sep;14(9):1419-24.
- b. Santos L, et al. Is DNA content alteration a consequence of proliferative and differentiation changes in urothelial bladder tumours. *Acta Urol* 2003; 20: 9-17.
- c. Lima L, Oliveira D, Tavares A, Amaro T, Cruz R, Oliveira MJ, Ferreira JA, Santos L. The predominance of M2-polarized macrophages in the stroma of low-hypoxic bladder tumors is associated with BCG immunotherapy failure. *Urol Oncol.* 2014 May;32(4):449-57.
- d. Lima L, Silva J, Amaro T, Morais A, Lopes C, Medeiros R, Videira PA, Santos L. IL-4 and TNF-α polymorphisms are associated with risk of multiple superficial tumors or carcinoma in situ

**Complete List of Published Work in MyBibliography:**

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2. Carneiro F, **Santos L**, Sobrinho-Simoes M. Carcinoma arising in gastric hyperplastic polyps. *Gastrointest Endosc*. 1995 Feb;41(2):178-9.
3. **Santos L**, et al. The prognostic value of MDM2 overexpression in superficial urothelial bladder carcinoma. *Rev Oncol* 2002; 4:322-6
4. **Santos L**, et al. Neovascularisation is a prognostic factor of early recurrence in T1/G2 urothelial bladder tumours. *Ann Oncol*. 2003 Sep;14(9):1419-24.
5. **Santos L**, et al. Chromosome instability and progression in urothelial cell carcinoma of the bladder. *Acta Oncol*. 2003;42(2):169-73
6. **Santos L**, et al. Ki-67 index enhances the prognostic accuracy of the urothelial superficial bladder carcinoma risk group classification. *Int J Cancer*. 2003 Jun 10;105(2):267-72.
7. **Santos L**, et al. Is DNA content alteration a consequence of proliferative and differentiation changes in urothelial bladder tumours. *Acta Urol* 2003; 20: 9-17.
8. **Santos LL**, et al. Expression of cell-cycle regulatory proteins and their prognostic value in superficial low-grade urothelial cell carcinoma of the bladder. *Eur J Surg Oncol*. 2003 Feb;29(1):74-80.
9. Dinis-Ribeiro M, da Costa-Pereira A, Lopes C, **Lara-Santos L**, Guilherme M, Moreira-Dias L, Lomba-Viana H, Ribeiro A, Santos C, Soares J, Mesquita N, Silva R, Lomba-Viana R. Magnification chromoendoscopy for the diagnosis of gastric intestinal metaplasia and dysplasia. *Gastrointest Endosc*. 2003 Apr;57(4):498-504.
10. Pinto C, Veiga I, Pinheiro M, Mesquita B, Jeronimo C, Sousa O, Fragoso M, **Santos L**, Moreira-Dias L, Baptista M, Lopes C, Castedo S, Teixeira MR. MSH6 germline mutations in early-onset colorectal cancer patients without family history of the disease. *Br J Cancer*. 2006 Sep 18;95(6):752-6. Epub 2006 Aug 29.
11. Pina-Cabral L, **Santos L**, Mesquita B, Amaro T, Magalhães S, Criado B. Detection of survivin mRNA in urine of patients with superficial urothelial cell carcinomas. *Clin Transl Oncol*. 2007 Nov;9(11):731-6.
12. Palmeira CA, Oliveira PA, Seixas F, Pires MA, Lopes C, **Santos L**. DNA image cytometry in bladder cancer: state of the art. *Anticancer Res*. 2008 Jan-Feb;28(1B):443-50. Review
13. Pinto-Leite R, Botelho P, Ribeiro E, Oliveira PA, **Santos L**. Effect of sirolimus on urinary bladder cancer T24 cell line. *J Exp Clin Cancer Res*. 2009 Jan 7;28:3.
14. Barros-Silva JD, Leitão D, Afonso L, Vieira J, Dinis-Ribeiro M, Fragoso M, Bento MJ, **Santos L**, Ferreira P, Dinis-Ribeiro M, Costa-Pereira A, Lopes C, Guilherme M, Moreira-Dias L, Lomba-Viana H, Ribeiro A, Santos C, Soares J, Mesquita N, Silva R, Lomba-Viana R. Magnification chromoendoscopy for the diagnosis of gastric intestinal metaplasia and dysplasia. *Gastrointest Endosc*. 2003 Apr;57(4):498-504.

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15. Afonso J, **Santos LL**, Amaro T, Lobo F, Longatto-Filho A. The aggressiveness of urothelial carcinoma depends to a large extent on lymphovascular invasion--the prognostic contribution of related molecular markers. *Histopathology*. 2009;55(5):514-24.
16. Pinheiro M, Veiga I, Pinto C, Afonso L, Sousa O, Fragoso M, **Santos L**, Lopes P, Pais I, Lopes C, Teixeira MR. Mitochondrial genome alterations in rectal and sigmoid carcinomas. *Cancer Lett*. 2009 Jul 18;280(1):38-43
17. Palmeira C, Oliveira PA, Arantes-Rodrigues R, Colaço A, De la Cruz PL, Lopes C, **Santos L**. DNA cytometry and kinetics of rat urothelial lesions during chemical carcinogenesis. *Oncol Rep*. 2009;21(1):247-52.
18. Oliveira PA, Arantes-Rodrigues R, Sousa-Diniz C, Colaço A, Lourenço L, De La Cruz LF, Da Silva VM, Afonso J, Lopes C, **Santos L**. The effects of sirolimus on urothelial lesions chemically induced in ICR mice by BBN. *Anticancer Res*. 2009;29(8):3221-6
19. Pinheiro M, Ahlquist T, Danielsen SA, Lind GE, Veiga I, Pinto C, Costa V, Afonso L, Sousa O, Fragoso M, **Santos L**, Henrique R, Lopes P, Lopes C, Lothe RA, Teixeira MR. Colorectal carcinomas with microsatellite instability display a different pattern of target gene mutations according to large bowel site of origin. *BMC Cancer*. 2010; 27;10:587.
20. Silva M, Veiga I, Ribeiro FR, Vieira J, Pinto C, Pinheiro M, Mesquita B, Santos C, Soares M, Dinis J, **Santos L**, Lopes P, Afonso M, Lopes C, Teixeira MR. Chromosome copy number changes carry prognostic information independent of KIT/PDGFR $\alpha$  point mutations in gastrointestinal stromal tumors. *BMC Med*. 2010; 14;8:26.
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22. Palmeira C, Lameiras C, Amaro T, Lima L, Koch A, Lopes C, Oliveira PA, **Santos L**. CIS is a surrogate marker of genetic instability and field carcinogenesis in the urothelial mucosa. *Urol Oncol*. 2011;29(2):205-11.
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26. Palmeira C, Oliveira PA, Lameiras C, Amaro T, Silva VM, Lopes C, **Santos L**. Biological similarities between murine chemical-induced and natural human bladder carcinogenesis. *Oncol Lett*. 2010;1(2):373-7.
27. Vitorino R, Alves R, Barros A, Caseiro A, Ferreira R, Lobo MC, Bastos A, Duarte J, Carvalho D, **Santos LL**, Amado FL. Finding new posttranslational modifications in salivary proline-rich proteins. *Proteomics*. 2010;10(20):3732-42.

fluids. *Anal Chem.* 2011;15;83(18):7035-43.

29. Lima L, Silva J, Amaro T, Morais A, Lopes C, Medeiros R, Videira PA, **Santos L**. IL-4 and TNF- $\alpha$  polymorphisms are associated with risk of multiple superficial tumors or carcinoma in situ development. *Urol Int.* 2011;87(4):457-63.
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31. Reis CA, Campos D, Osório H, **Santos LL**. Glycopeptide microarray for autoantibody detection in cancer. *Expert Rev Proteomics.* 2011 Aug;8(4):435-7.
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34. Lima L, Dinis-Ribeiro M, Longatto-Filho A, **Santos L**. Predictive biomarkers of bacillus calmette-guérin immunotherapy response in bladder cancer: where are we now? *Adv Urol.* 2012;2012:232609.
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36. Pinto-Leite R, Arantes-Rodrigues R, Palmeira C, Colaço B, Lopes C, Colaço A, Costa C, da Silva VM, Oliveira P, **Santos L**. Everolimus combined with cisplatin has a potential role in treatment of urothelial bladder cancer. *Biomed Pharmacother.*
37. Afonso J, Longatto-Filho A, Martinho O, Lobo F, Amaro T, Reis RM, **Santos LL**. Low RKIP expression associates with poor prognosis in bladder cancer patients. *Virchows Arch.* 2013 Apr;462(4):445-53.
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40. Arantes-Rodrigues R, Pinto-Leite R, Fidalgo-Gonçalves L, Palmeira C, **Santos L**, Colaço A, Oliveira P. Synergistic effect between cisplatin and sunitinib malate on human urinary bladder-cancer cell lines. *Biomed Res Int.* 2013;2013:791406.
41. Ferreira JA, Videira PA, Lima L, Pereira S, Silva M, Carrascal M, Severino PF, Fernandes E, Almeida A, Costa C, Vitorino R, Amaro T, Oliveira MJ, Reis CA, Dall'olio F, Amado F, **Santos LL**. Overexpression of tumour-associated carbohydrate antigen sialyl-Tn in advanced bladder tumours. *Mol Oncol.* 2013 Jun;7(3):719-31.

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#### **D. Papers in Portuguese periodicals with referees**

- 1) Santos L, et al. Acumulação da proteína p53 nos carcinomas transicionais da bexiga de morfologia papilar: impacto na progressão tumoral. *Arq Port Cirurgia* 2000;9 : 123-8.
- 2) Santos L, et al. Is DNA content alteration a consequence of proliferative and differentiation changes in urothelial bladder tumours. *Acta Urol* 2003; 20: 9-17.
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- 4) *URO* 2000; 5: 31-36
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- 7) Silva J et al. Cirurgia "fast track" no cólon: resultados de um estudo piloto. *Rev Port de Cirurgia* 2010; 12: 11.

#### **Books**

Cancro oral (oral cancer), Lidel, 2013

Cancro da Mama o que devemos saber (breast cancer), Lidel, 2014

#### **C. Research Support**

#### **Ongoing Research Support**

**a. Name**

Experimental Pathology and Therapeutics Group

**b. Group Leader**

Prof. Lúcio José de Lara Santos

**c. Team Members (number)**

- i. Senior scientist (3)
- ii. Post docs (2)
- iii. PhD students (7)
- iv. MSc Students (2)
- v. Nurses
- vi. Graduate Students (1)
- vii. Clinicians with laboratory sessions (3)

**d. Programmes/Aims and Keywords**

- a) Identify biomarkers that allow a refinement of the prognosis and better allocation of treatment resources;
- b) Identify therapeutic targets;
- c) Develop new drugs and personalized treatments;
- d) Study the mechanisms of resistance to anti-cancer therapies;
- e) Develop experimental models that allow to study anti-cancer therapeutics;
- f) Study malignancies associated with infection.

Keywords: Bladder cancer; Gastro-intestinal cancer; glicobiomarkers; Therapeutics.

**e. Projects: Title, funding**

1-Development of monoclonal antibodies based in glicobiomarkers as therapeutics for chemoresistent bladder cancer – IPO-Porto

2-Towards a single therapy with a synergistic drug combination against triple negative breast cancer and neuroblastoma by nucleoli-mediated multicellular targeting (**Referência** (FCT): ENMed/0005/2015

3- Estudo Luzitin - EPTG\_IPO – PDT and immunoncology.

**f. Recent achievements (2013-2015)**

The Experimental Pathology and Therapeutics group has been studying the pathobiologic mechanisms behind cancer to improve prevention and/or treatment. In the past years, it has been evaluating the response of bladder tumors to available drugs to define prognostic groups (molecular) and seeking novel agent

chemically induced bladder tumors in animal models). More recently it has also focused on determining the molecular mechanisms associated with Infection with *Schistosoma haematobium*, an endemic parasite of Angola and other parts of Africa and Asia, in an attempt to determine its role in the development of chronic infections and ultimately bladder cancer.

In the field of bladder cancer biomarkers, the group has studied cell-surface protein glycosylation associated with malignant transformations. This allowed the identification of a cell-surface cancer-associated protein glycosylation termed sialyl-Tn (sTn) associated with bladder cancer invasion and metastasis. This has been one of the top research highlights of the group published in 2013. The sTn antigen offers potential to target aggressive cancer cells and control disease progression; the group is now devoted to develop therapeutics based on this glycan. Other biomarker research topics included the establishment of a panel of biomarkers (histologic, genetic, molecular) of response to Bacillus Calmette-Guerin immunotherapy, the gold standard therapeutics for bladder cancer patients at a high-risk of recurrence/progression. This score may be a helpful tool to identify patients with poor prognosis and to improve clinical decision. The group further described lymphovascular invasion, and RKIP, CD147 and MCT1 expressions, as relevant prognostic and/or predictive biomarkers of bladder cancer, and as promising areas of therapeutic intervention.

The group has also been devoted to improving the therapeutics for invasive bladder tumors. It was observed that combination of temsirolimus or everolimus, two mammalian targets of rapamycin (mTOR) inhibitors, with cisplatin and gemcitabine enhanced cytotoxicity efficacy, namely in the muscle-invasive urinary bladder-cancer cell lines. Although further studies are necessary to complement this data, the results open new perspectives in muscle invasive urinary bladder cancer treatment.

In the field of animal models of cancer, the group has developed realistic models for developing innovative diagnostic and therapeutic strategies. The group collaborated with UTAD in the establishment and characterization of two animal (mouse and rat) bladder cancer models, induced by oral nitrosamine administration. These models represent a muscle-invasive and papillary bladder urothelial carcinoma. The group has now also established direct bladder cancer xenografts in nude mice. All these models showed remarkable similarities with human lesions and are in use for testing innovative bladder cancer treatments. Recently, other chemically induced models have been developed, namely a rat mammary cancer and a mouse liver cancer model. These models are currently being characterized morphologically and molecularly, so they can be made available for testing diagnostic and therapeutic strategies.

**g.** 10 Selected Publications (2013-2015)

Ferreira JA, Videira PA, Lima L, Pereira S, Silva M, Carrascal M, Severino PF, Fernandes E, Almeida A, Costa C, Vitorino R, Amaro T, Oliveira MJ, Reis CA, Dall'olio F, Amado F, Santos LL. Overexpression of tumour-associated carbohydrate antigen sialyl-Tn in advanced bladder tumours. *Mol Oncol.* 2013 Jun;7(3):719-31.

Lima L, Severino PF, Silva M, Miranda A, Tavares A, Pereira S, Fernandes E, Cruz R, Amaro T, Reis CA, Dall'Olio F, Amado F, Videira PA, Santos L, Ferreira JA. Response of high-risk of recurrence/progression bladder tumours expressing sialyl-Tn and sialyl-6-T to BCG immunotherapy. *Br J Cancer*. 2013 Oct 15;109(8):2106-14.

Bernardo C, Costa C, Amaro T, Gonçalves M, Lopes P, Freitas R, Gärtner F, Amado F, Ferreira JA, Santos L. Patient-derived sialyl-Tn-positive invasive bladder cancer xenografts in nude mice: an exploratory model study. *Anticancer Res*. 2014 Feb;34(2):735-44.

Carrascal MA, Severino PF, Guadalupe Cabral M, Silva M, Ferreira JA, Calais F, Quinto H, Pen C, Ligeiro D, Santos LL, Dall'Olio F, Videira PA. Sialyl Tn-expressing bladder cancer cells induce a tolerogenic phenotype in innate and adaptive immune cells. *Mol Oncol*. 2014 May;8(3):753-65.

Lima L, Oliveira D, Ferreira JA, Tavares A, Cruz R, Medeiros R, Santos L. The role of functional polymorphisms in immune response genes as biomarkers of BCG Immunotherapy outcome in bladder cancer: Establishment of a predictive profile in a Southern Europe population. *BJU Int*. 2014 Jun 16.

Afonso J, Santos LL, Miranda-Gonçalves V, Morais A, Amaro T, Longatto-Filho A, Baltazar F. CD147 and MCT1-potential partners in bladder cancer aggressiveness and cisplatin resistance. *Mol Carcinog*. 2014 Sep 27. doi: 10.1002/mc.22222. [Epub ahead of print].

Santos J, Fernandes E, Ferreira JA, Lima L, Tavares A, Peixoto A, Parreira B, Correia da Costa JM, Brindley PJ, Lopes C, Santos LL (2014) P53 and cancer-associated sialylated glycans are surrogate markers of cancerization of the bladder associated with *Schistosoma haematobium* infection. *PLoS neglected tropical diseases* 8: e3329.

Azevedo R, Ferreira JA, Peixoto A, Neves M, Sousa N, Lima A, Santos LL. Emerging antibody-based therapeutic strategies for bladder cancer: A systematic review. *J Control Release*. 2015 Sep 28;214:40-61. doi: 10.1016/j.jconrel.2015.07.002. Epub 2015 Jul 18.

Fernandes E, Ferreira JA, Andreia P, Luís L, Barroso S, Sarmiento B, Santos LL. New trends in guided nanotherapies for digestive cancers: A systematic review. *J Control Release*. 2015 Jul 10;209:288-307. doi: 10.1016/j.jconrel.2015.05.003. Epub 2015 May 6.

Costa C, Pereira S, Lima L, Peixoto A, Fernandes E, Neves D, Neves M, Gaitero C, Tavares A, Gil da Costa RM, Cruz R, Amaro T, Oliveira PA, Ferreira JA, Santos LL. Abnormal Protein Glycosylation and Activated PI3K/Akt/mTOR Pathway: Role in Bladder Cancer Prognosis and Targeted Therapeutics. *PLoS One*. 2015 Nov 16;10(11):e0141253. doi: 10.1371/journal.pone.0141253

#### **h. Collaborations (national/international)**

##### **National Collaborators**

Professor Francisco Amado (Proteomics; UAveiro);

Professor Paula Oliveira (veterinary sciences and cancer animal models; UTAD);

Professor Paula Videira (glycoimmunology; CEDOC-FCM-UNL);

Professor Bruno Sacramento (immunogenetics; INEP);

Professor Celso Reis (cancer glycobiology, IPATIMUP);

Professor Paula Soares (cancer biology, IPATIMUP);

Professor André Silva (mass spectrometry; FC-UPorto)

Professor José Manuel Correia da Costa (parasite infection, NSA – National Institute of Health).

**International Collaborators**

Clinica Sagrada Esperança in Angola, Julio Santos and Lygia Viera Lopes

Hospital Central Maputo, Jotamo Come

Adhemar Longato at Hospital Hospital de Cancer de Barretos - Fundação PIO XII, HCB, Brasil

Fabio Dall Olio (University of Bologne)

Jesus Prieto (University of Navarra) among others.