

CURRICULUM VITAE

Nuno M.C.S. Arantes e Oliveira

Born on February 14, 1974, in Lisbon, Portugal

Married, three children

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Main Current Positions

MIT Portugal Program

Invited Assistant Professor, Innovation and Technological Change, IST Lisbon, since 2015.

- Position created to foster innovative and entrepreneurial thinking across the four doctoral programs of MIT Portugal: Bioengineering Systems (BIO), Engineering Design and Advanced Manufacturing (EDAM), Sustainable Energy Systems (SES) and Transportation Systems (TrSys).
- Responsible for four innovation-related doctoral courses. Involved in several others.
- Organizing workshops and roundtables on cutting-edge innovation topics, in Portugal and at MIT.

Arantes Saúde Lda., Oeiras, Portugal

Managing Partner (sócio-gerente)

Family office. Investments and Services in Healthcare.

- Provides consulting services in Healthcare, Innovation and Life Sciences business creation.
- Provides clinical services in pediatric specialties.
- Owns and manages *Kids&Teens – Clínica do Lago* pediatric specialty clinic, in Lisbon.

www.kidsandteens.clinic

ALCEA Advisors, Paris, France

Venture Partner, since 2017

Venture Capital fund investing in Oncology startups in Europe.

Oceano Fresco, Lda., Mira, Portugal

Founding Board member, since 2017

Shellfish Breeding for Aquaculture. Pioneer in the development of high-value mollusk strains.

P-BIO – Portugal's Biotechnology Industry Organization, Cantanhede, Portugal

Chairman of the General Assembly since 2015 (see below)

Coimbra Genomics, S.A, Cantanhede, Portugal

Chief Advisor, since 2015 (see below)

Past Positions

Coimbra Genomics S.A. Cantanhede, Portugal. www.coimbra-genomics.com

Founder. Chairman of the Board of Directors 2015-16. Chief Executive Officer 2013-15.

Personalized medicine company developing software tools for clinical decision.

- Launched company with Critical Software and the Biocant Park. Became its first CEO.
- Recruited initial development team.
- Led company through full development of first product.
- Steered initial product deployment in top hospitals in three countries.
- Raised approx. €2.5 million in seed venture capital, non-dilutive funding and corporate partnerships.
- Led Portuguese-Chinese R&D consortium in gastric cancer.
- As Chairman, co-led implementation of partnerships with hospitals, healthcare companies and Government authorities in six countries. Helped the company enter clinical stage (use in human subjects) and make its first international sales.

P-BIO – Portugal’s Biotechnology Industry Organization. www.p-bio.org

President 2012-15. Board member 2007-15.

Portugal’s sole association of life-science companies. As President:

- Increased membership by 25% and member fee revenue by >33% during tenure;
- Co-organized major international investor events and sector delegations;
- Organized annual meetings involving major national and international stakeholders.
- Oversaw launch of lobby groups on orphan drugs and industrial biotech;
- Rebranded and renamed association (formerly called APBio);
- Sealed multiple national and international partnerships.

Health Cluster Portugal

Coordinator, Specialty Clusters Initiative, 2013-2014. Board Member, 2008-2013

Leading non-profit organization for innovation in healthcare, with over 100 members.

- Joined founding board in 2008.
- Stepped down from Board in 2013 to take charge of the specialty clusters (sub-clusters) initiative.
- Led the creation of clusters in Neuroscience and Oncology involving most major national players.
- Led the selection of leaders and founding partners for each sub-cluster.
- Launched the bases for major international translational projects.

IPATIMUP – Institute for Molecular Pathology and Immunology of the University of Porto

Coordinator for Innovation and Translational Research, 2012-2013.

Leading research institute in oncology; no.1 worldwide on stomach and thyroid cancer.

- Launched new Innovation and Translational Research units, which went on to generate spin-off companies and major R&D partnerships with pharmaceutical companies.

HemoCORM Ltd, London, UK

Chairman of the Board of Directors, 2008-2017.

Drug development company, pioneer in carbon monoxide-based therapies. Founded in 2002.

Acquired by Alfama, Inc.

Alfama, Inc., Cambridge MA

Co-founder, President and Chief Executive Officer, 2005-2017.

Drug development company, global leader in carbon monoxide-based therapies.

Acquired by Boston-based Proterris, Inc. (www.proterris.com)

- Invited by Dr. Werner Haas, former scientist and advisor to the President of R&D at Hoffman-La Roche, to launch the company and act as CEO.
- Founded company with internationally renowned scientists, pharma executives and entrepreneurs.

- Raised over €10M in venture capital from >20 investors at valuations above \$40 million, plus >€4M in competitive EU and US grants.
- Led the acquisition of main rival hemoCORM Ltd, of London.
- Set up chemistry, biology and pharmacology labs in Boston and Lisbon.
- Successfully negotiated partnerships with two multibillion dollar biotech companies.
- Attracted top-level global network of advisors and partners (incl. >10 universities in several countries).
- Company filed multiple international patent applications, conducted groundbreaking work in pharmaceutical chemistry, and produced several high-potential drug candidate molecules.
- Managed wholly-owned subsidiary *Alfama Lda.* in Oeiras, Portugal.

ATGC Portugal, Oeiras, Portugal

Managing Partner, 2002-2005.

Technology transfer company with innovative business model.

- Launched company and led some of the largest tech transfer deals to benefit Portuguese universities.
- Evaluated well over 50 projects and technologies, from a business, IP and scientific viewpoint, in the fields of drug development, research tools, diagnostics and bio-fuels.
- Advised several institutions on intellectual property commercialization and business spin-offs, including Portugal's Industrial Property Institute (INPI) and Tagus Park (creation of new spin-off).
- Sold share for high multiple.

IN+ Center for Technology Development and Policy Studies, IST, Lisbon, Portugal

Post-doctoral fellow, 2002-2005, under Prof. Manuel Heitor.

(now Senior Research Fellow)

- Studied entrepreneurship and innovation in Portuguese biotech, and obstacles to its growth.
- Participated in lecture series, business plan competitions and initiatives to promote entrepreneurship.

Education

University of California San Francisco (UCSF)

Invited doctoral student in Genetics, 1998-2002, under Professor Cynthia Kenyon.

PhD thesis presented at UCSF; Doctoral degree awarded by the **Faculty of Science of the University of Lisbon** with Highest Honors. Led seminal studies on the genetic and molecular bases of aging and lifespan regulation. Achieved *the longest artificial lifespan extension ever produced in any living being*. Published several high-impact papers, including three in *Science* (see below).

Gulbenkian Institute of Science (IGC), Oeiras, Portugal

Gulbenkian Doctoral Program in Biology and Medicine, class of 1997.

Pioneer doctoral program; selected ~16 candidates each year and awarded a double fellowship (from the Gulbenkian Foundation and the Portuguese Government) for studies abroad. Included intensive lecture modules on diverse subjects, from bioinformatics to cancer biology, mostly given by renowned international experts.

Faculty of Science of the **University of Lisbon**, Portugal

Licenciatura (4-year degree ≈ BSc/MSc) in Biology, 1997.

Studied multiple subjects including History and Philosophy of Science, Biostatistics, Ecology, Molecular Biology, Genetics, Evolution, Biological Oceanography, and Developmental Biology.

Additional Education

Harvard University Kennedy School of Government, Cambridge, MA, United States
Executive course: Leadership for the 21st Century (Azores class), 2008.

Harvard Business School, Boston, MA, United States
Executive course: Leadership and Strategy in Pharmaceuticals and Biotech, 2006.

Haas School of Business, University of California Berkeley
Entrepreneurship In Biotechnology class, 2001.

Various courses on subjects including Astronomy, Ethology, Business Development, FP7 Project Management, Genomics, Japanese Language and Culture, and Chinese Language and Culture.

Advisory, Consulting, Jury and Board roles

European Institute of Technology (EIT), Knowledge Innovation Community (KIC)
Member of the Jury for the InnoEnergy PhD School, 2017.

MIT Technology Review “Innovators Under 35” Europe contest
Member of the Jury, 2017.

SerFarma, Coimbra, Portugal
Senior Advisor, since 2016. Digital health start-up.

Nano4 Technologies, Lisbon, Portugal
Advisor, since 2016. PoC Diagnostics start-up.

Wonders MedTech GmbH, Basel, Switzerland
Advisor, since 2016. Market expansion and business development in the Life Sciences.

Coimbra Genomics, S.A., Cantanhede, Portugal
Chief Advisor, since 2016. Founder and formerly CEO and Chairman (see above).

Tech_Fab, Moscow, Russian Federation
Advisor, 2016. Wearable medical technology start-up.

Portugal Ventures, Lisbon, Portugal
Expert project evaluator in life sciences and medtech on several “Calls for Entrepreneurship”, since 2012. State venture capital agency investing in seed-stage technology based projects.

European Commission, Brussels, Belgium
Expert Evaluator, 7th Framework Programme and Horizon 2020, since 2003.

CEDOC – Center for the Study of Chronic Diseases, NOVA University Lisbon, Portugal
Senior Advisor, 2012-2013. Advised the Director on intellectual property protection and management, the creation of a clinical research unit, creation of spin-off companies and the commercial exploitation of a new R&D building.

Critical Software S.A. and **Biocant Park**
Consultant, PORGENE project, 2012-2013. Led to the foundation of Coimbra Genomics S.A.

Foundation for Science and Technology (FCT), Lisbon, Portugal

Expert Evaluator, 2010-12.

Institute for Chemical and Biological Technology (ITQB), NOVA University Lisbon, Portugal
Invited member of Commission in charge of the revision of the Institute's by-laws, 2009.

Health Cluster Portugal board member, 2008-2013 (see above).

P-BIO board member, 2007-2011 (see above).

Organization for Economic Cooperation and Development (OECD), Paris, France
Steering Group member, OECD International Futures Program, *The BioEconomy to 2030*, 2006.

Innovation Agency (AdI), Government of Portugal, Lisbon, Portugal'09
Expert Evaluator, 2005-06.

Since 2002, **member of the jury** in various entrepreneurship competitions, including the **Solvay Ideas Challenge**, the **MIT-Portugal Venture competition**, and **MIT Bio-teams**.

American Academy for the Advancement of Science (AAAS), Washington DC
Consultant, 2001-2002. The world's largest general scientific society.

Occasional advisor or author of invited expert views to the **Ministry of Science and Technology of Portugal**, the **Portuguese Parliament**, Portugal's **National Institute for Industrial Property (INPI)**, the **Câmara Municipal de Lisboa (Municipality of Lisbon)**, and the **Câmara Municipal de Oeiras (Municipality of Oeiras)**, among others.

Formal or informal advisor (occasionally shareholder) of **several start-up companies** in the life science and information technology space, since 2005.

Project Coordination

C-GENE – Development of a Genomics Platform for Clinical Decision Support.
Project Coordinator (on behalf of Coimbra Genomics S.A.), 2013-2015. QREN (Portuguese Government EU funds) grant. Budget: €1 million.

NGastricS - Using NGS to uncover structural and regulatory variation in Gastric Cancer.
Project Coordinator (on behalf of Coimbra Genomics S.A.), 2013-2015. Project co-sponsored by the Beijing Genomics Institute (BGI) and involving the IPATIMUP. Budget: €900K.

CORM-POI – Development of CO-releasing molecules for the treatment of post-operative ileus.
Project Coordinator (on behalf of Alfama Lda.), 2010-2011. EUREKA Eurostars project involving a Portuguese-Spanish consortium. Budget: ~€600K.

CORM-RA - Development of CO-releasing molecules to treat rheumatoid arthritis.
Project Coordinator (on behalf of Alfama Lda.), 2009-2011. European Commission FP7-funded project involving seven companies from Portugal, Italy and Switzerland. Budget: €1.1 million.

Development of CORMs

Project Coordinator (on behalf of Alfama Lda.), 2008-2010. Testing the Chemical and Biological Parameters of the CO-RM Platform for the Development of Novel Drugs. QREN (Portuguese Government EU funds) grant. Budget: €4.3 million.

COTEC, Porto, Portugal

Coordinator, **VIABio** Study – Biotechnology and Innovation in the Portuguese Industry, 2005-06. Private initiative, the first of its kind, aimed at fostering the application of biotechnological solutions to “traditional” sectors of the Portuguese industry (textiles, energy, forestry and agro-food). Sponsored by COTEC Portuguesa, the IN+ Center, the Luso-American Foundation (FLAD), and eight of Portugal’s largest companies: GALP Energia, EDP, Corticeira Amorim, UNICER, Têxtil Manuel Gonçalves (TMG), Lameirinho, Portucel, and Efacec.

PICPL - Scientific Cooperation between Portuguese-Speaking Countries, Maputo, Mozambique and Lisbon, Portugal.

Founder and Coordinator, 2001-02. First-in-kind project aimed at establishing strong links between the medical and scientific communities of developing Portuguese-speaking countries and the major science hubs worldwide. Drew on the experience and connections of a wide network of Portuguese post-docs and graduate students over the world, to promote advanced education and research exchanges. Sponsored by the Gulbenkian Foundation and others.

Participation in multiple projects financed by the **European Commission’s FP7** (COST, Research for SMEs, Large Scale Integrating Projects), Portugal’s Foundation for Science and Technology (**FCT**), Portugal’s Innovation Agency (**AdI**), and Portugal’s Institute for the Support to Small and Medium Enterprises and Innovation (**IAPMEI**).

Teaching and Supervisory Experience

Co-Supervisor of master’s degree candidate João Perdiz, Instituto Superior Técnico – **IST**, University of Lisbon. Subject: Financing of Healthcare Innovation in Portugal, since 2017.

Co-Supervisor of master’s degree candidate Francisco Aivado Nunes, Instituto Superior Técnico – **IST**, University of Lisbon. Subject: Venture Capital and the Success of Technological Startups in Portugal, since 2017.

Co-Supervisor of master’s degree candidate Miguel Sampaio Guimarães, Instituto Superior Técnico – **IST**, University of Lisbon. Subject: The Venture Capital industry in Portugal, since 2017.

Member of the Doctoral Thesis Committee of Tiago Fonseca, **MIT Portugal** Program and Instituto Superior Técnico – **IST**, Lisbon, since 2016. Subject: methodologies for spray-drying processes in drug development (with Hovione Farmaciênica S.A.).

Co-Organizer and Lecturer on the International Workshop on Innovating series of annual events, Massachusetts Institute of Technology (**MIT**), Cambridge, Massachusetts, USA, since 2016.

Supervisor of doctoral candidate Rui Palhais, Instituto Superior Técnico – **IST**, University of Lisbon and **MIT Portugal Program**. Subject: Additive Manufacturing for Medical Applications, 2016-17.

Thesis jury member (discussant) for doctoral candidate Bruno Veigas, Faculty of Science and Technology – **FCT**, NOVA University of Lisbon, 2016.

Lecturer in the **Transport Innovation and Entrepreneurship** course, Transportation Systems doctoral program, **MIT Portugal**, Universities of Porto and Coimbra and Instituto Superior Técnico (**IST**), since 2016.

Coordinator of the **International Industry Roundtables (IIR)** initiative of **MIT Portugal**, with **Fraunhofer Institutes** and Instituto Superior Técnico, (**IST**) since 2015 (with João Bigotte and Douglas P Hart). Periodical events joining together key players from cutting-edge industries, entrepreneurs, decision-makers, researchers and graduate students. Leading role in the organization of two IIR on **Healthcare**

Technologies (Lisbon, 2016 and 2017) and one IIR on **Biotechnologies for Traditional Industries** (Mira, Portugal, 2017).

Coordinator of iTeams course, EDAM doctoral program, **MIT Portugal** and Instituto Superior Técnico (**IST**), since 2016.

Coordinator of Innovation Studies course, EDAM doctoral program, **MIT Portugal** and Instituto Superior Técnico (**IST**), since 2016.

Lecturer in various Innovation-related courses and events (**I&E Week; iTeams; Innovation in Bioengineering**), Bioengineering Systems doctoral program, **MIT Portugal** and Instituto Superior Técnico (**IST**), since 2015.

Coordinator of Research Seminar course, EDAM and SES doctoral programs, **MIT Portugal** and Instituto Superior Técnico (**IST**), since 2015.

Chairman of the Doctoral Thesis Committee of Miguel Amador, **MIT Portugal** Program and Instituto Superior Técnico – **IST**, Lisbon, since 2015. Subject: novel regulatory pathways for personalized therapy approval and adoption.

Member of the Doctoral Thesis Committee of José Rodrigues, **MIT Portugal** Program and Instituto Superior Técnico – **IST**, Lisbon, since 2015. Subject: catalytic reactors involving nanomaterials for cleaner combustion.

Co-supervisor of post-doctoral researcher Bruno Reynolds, Institute for Chemical and Biological Technology – **ITQB**, NOVA University of Lisbon, 2009-2011. Subject: technology transfer.

Co-supervisor of doctoral candidate João Seixas, Institute for Chemical and Biological Technology – **ITQB**, NOVA University of Lisbon and Alfama Lda. Subject: organometallic chemistry.

Thesis jury member for doctoral candidate Lúcia Nobre, Institute for Chemical and Biological Technology – **ITQB**, NOVA University of Lisbon.

Invited lecturer in several classes or seminars at various doctoral and master's courses in Portuguese universities, including Instituto Superior de Economia e Gestão – **ISEG** (Science and Technology Policy Master's), **NOVA School of Management** (MBA), Instituto Superior Técnico – **IST** (Seminars on Innovation and Development), and the **Faculty of Pharmacy, University of Coimbra**, among others.

Supervisor of three lab rotation students, **University of California San Francisco (UCSF)**, 1999-2001.

Peer-reviewed Publications

Arantes-Oliveira N. 2012. Life (Sciences) Beyond the Recession. **European Biotechnology News** 3(11):46-47.

Yamawaki TM, **Arantes-Oliveira N**, Berman JR, Zhang P, Kenyon C. 2008. Distinct activities of the germline and somatic reproductive tissues in the regulation of *Caenorhabditis elegans*' longevity. **Genetics** 178(1):513-26.

Arantes-Oliveira N. 2007. A case study on obstacles to the growth of biotechnology. **Technological Forecasting and Social Change** 74, 61–74.

Arantes-Oliveira N, Berman JR, Kenyon C. 2003. Modulation of the Insulin Pathway by the Gonad in *C. Elegans*: Animals that Live Six Times as Long as Normal. **Science** 302: 611.

Dillin A, Hsu A-L, **Arantes-Oliveira N**, Lehrer-Graiwer J, Fraser A, Kamath RS, Ahringer J, Kenyon C. 2002. Rates of behavior and aging specified by mitochondrial function during development. **Science** 298: 2398-2401.

Arantes-Oliveira N, Apfeld J, Dillin A, Kenyon C. 2002. Regulation of Life-Span by Germ-Line Stem Cells in *C. elegans*. **Science** 295:502-505.

Arantes-Oliveira N. 2001. From a quick comeback to a career. **Sci. Aging Knowledge Environ.** Oct 3;2001(1):vp3.

Arantes-Oliveira N. 2001. A Short Course on Aging. **Sci. Aging Knowledge Environ**: 1 DOI: 10.1126/sageke.2001.1.bb1

Several **posters** in international scientific meetings, 1999-2001.

Other Publications

Books:

VIABio – Biotecnologia e Inovação na Indústria Portuguesa: Estudo de Oportunidades Tecnológicas e de Mercado (Coordinator). COTEC Portuguesa, 2006.

Nova Activa Multimédia encyclopedia. Contributor to Volume 3: Experimental Sciences. Coordinator: Roberto Carneiro. Volume coordinator: Manuel Heitor. LexiCultural, 2004.

Biotecnologia: Poderá a Engenharia da Vida Moldar o Nosso Futuro? (*Biotechnology: Can the Engineering of Life Shape Our Future?*). Chapter in “Momentos de Inovação e Engenharia em Portugal, volume III”. Coordinators: Manuel Heitor, José Maria B. Brito e Maria Fernanda Rollo.

Genetic Studies of Lifespan, Aging and Reproductive Development in *Caenorhabditis elegans*. Doctoral Dissertation. FCUL, 2002.

Articles:

Several Op/Ed articles in top-tier generalist or financial Portuguese newspapers including **Público**, **Expresso**, **Diário Económico**, and **Vida Económica**, since 2003.

Several Op/Ed and review articles in specialized newspapers and magazines including **Marcas & Patentes** (National Institute for Industrial Property), **Boletim de Biotecnologia**, **Biologia & Sociedade** (Professional Association of Biologists), **Cadernos de Economia**, **Aspetos** (Luso-French Chamber of Commerce) and **Ciência Jovem**, since 2003.

Patents:

Carvalho A, Sousa H, **Arantes e Oliveira N**, Soares B, Pinto A, Lopes P. *Genome Query Handling*. Patent application no. 20151000096962 filed at the National Institute for Industrial Property of Portugal (pending), 2015.

Lectures and Conferences

Speaker in well over 100 conferences and seminars on genetics, biotech, innovation and entrepreneurship in several countries including Portugal, the United States, Canada, Chile,

Brazil, the United Kingdom, Spain, France, Germany, Belgium, China, Japan, Switzerland, Italy, Sweden, Finland, and Mozambique. Among the recent highlights are the TEDxPorto event and the Annual Meeting of the Trilateral Commission (hosted by Jean-Claude Trichet), 2016.

Awards, Honors and Fellowships

IBM Cloud Entrepreneur Award runner-up, 2015.

TechTour 20 selected company (Coimbra Genomics), 2015.

EU eHealth Competition, 2nd Biggest Promise in European eHealth (Coimbra Genomics, voted among 114 contestants), 2015.

PARSUK (Portuguese Association of Researchers and Students in the UK), Honorary Member, since 2010.

Municipality of Oeiras, Portugal: Silver Medal for Municipal Merit (for Alfama), 2009.

UK Trade & Investment: Award for Internationalization (Alfama), 2009.

BioSpain 2008: Best Company Presentation Award (Alfama), Granada, 2008.

Massachusetts Institute of Technology (MIT): selection for Global Entrepreneurship Lab (Alfama), 2006.

Gate2Growth Venture Contest (a.k.a. European Venture Contest): *Best start-up in Europe* (Alfama, voted among 300 participants from 22 countries), 2005. Europe's largest competition for high-growth start-up companies.

Gate2Growth Venture contest: Best company pitch (voted among finalists), Berlin, 2005.

Invited to accompany two Presidents of the Portuguese Republic on several **State Visits** to foreign countries, since 2003.

The Ministry of Science and Technology of Portugal: post-doctoral fellowship, 2002-2005.

Academia Europaea: *Burgen Scholar*, 2002.

Jacinto de Magalhães Genetics Institute: *Best Work in Genetics* – honorable mention, 2002.

The Ministry of Science and Technology of Portugal: doctoral fellowship, 1998-2002.

The Ministry of Foreign Affairs of Japan: Winner of the 20th *International Essay Contest*, 1998.

The Gulbenkian Foundation: Preparatory Doctoral fellowship, 1997-98.

Community Contributions and Media Impact

Participated in numerous initiatives to promote the **education of biological sciences and entrepreneurship among high-school and college students** in the Lisbon area, since 1997.

Member of the High Council (*Conselho Superior*) of **Colégio Valsassina**, one of Lisbon's largest private schools, since 2011.

Scientific and entrepreneurial achievements featured multiple times in **all the major newspapers, magazines, radio stations and TV channels in Portugal**, as well as in **major**

international media including Business Week, Wall Street Journal, BBC, Foreign Affairs, BioCentury, SCRIIP and many others.

Featured in several books, including “Marketing Vencedor” – as main subject of chapter “Alfama e um Gestor Visionário” (*Alfama and a Visionary Manager*) by Manuel Forjaz; “Voltar a Crescer” by Pedro Reis; and “The Longevity Seekers” by Ted Anton.

General Skills

In-depth experience in scientific management, technological development, commercialization of science, strategic management of biotechnology start-ups, fundraising, deal making, business development, technology transfer and exploitation of intellectual property.

Fluent in **English** and **Portuguese**;

Good command of **French** and **Spanish**;

Studied **Japanese** language and culture for two years (A grade twice, ranked no.1 in class);

Attended **Chinese** (Mandarin) classes for one semester (18/20 grade, ranked no.1 in class).

Test of English for Foreign Language speakers (**TOEFL**): percentile 99 (1997).

Graduate Management Admission Test (**GMAT**): score 690; percentile 96 (1997).

Prova Geral de Acesso (**PGA** – General Examination for University Admission): score 95/100 (1992).