BIOGRAPHICAL SKETCH

NAME: **Abdallah BADOU**

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

POSITION TITLE: **Professor of Immunology and Molecular Biology**

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 *(if applicable)*	Completion MM/YYYY	FIELD OF STUDY
University Hassan II, Casablanca, Morocco	BSc	07/1992	Biology (option: Immunology)
René Descartes University, Paris, France	MSc	07/1994	Physiology
Paul Sabatier University, Toulouse, France	PhD	06/1998	Immunology
Yale University, Connecticut, USA	Post-doc	02/2005	Immunology and Molecular Biology
University Cadi Ayyad's degree "Capacity to lead research and teaching activities"	« Professeur Habilité »	05/2012	Immunopathology and Inflammation

A. Specific Statement

I have completed my Master's degree in René Descartes University (Paris, France) in 1994, then my PhD in Immunology in 1998 at Paul Sabatier University (Toulouse, France). Afterwards, I joined the Immunobiology department at Yale University School of Medicine (Connecticut, USA) from 1999 to 2007, as a post-doc then as a research scientist. In 2007, I joined Cadi Ayyad University in Morocco as assistant then qualified professor (2007 to 2014). Since 2014, I was affiliated to the Faculty of Medicine and Pharmacy of Casablanca. My current research topics are related to the study of the immune cells and related factors in the tumor microenvironment.

Languages: Arabic, English and French.
Research ID and Scores: orcid: 0000-0003-4849-9085; RG Score: 31.14; H index: 16.

B. Positions and Employment

2018 - present **Professor of Immunology**, Faculty of Medicine and Pharmacy, Casablanca, Morocco.
2014 - present **Visiting Professor**, University Mohamed VI for health Sciences, Casablanca, Morocco.
2014 – 2018 **Qualified Professor**, Faculty of Medicine and Pharmacy, Casablanca, Morocco.
2012 - 2014 **Qualified Professor,** Cadi Ayyad University, Safi, Morocco.
2007 - 2012 **Assistant Professor,** Cadi Ayyad University, Polydisciplinary Faculty, Safi, Morocco.
2005 - 2007 **Associate research scientist,** Yale University, Connecticut, USA.

C. Professional Memberships and invitation as examiner

2014 – present Invitation (over 10 times) for participation in PhD thesis evaluations.
2013 - present Invitation (over 6 times) for participation in Assistant Professors' recruitment in different Universities.
2011 - 2013 Elected member of the council of the Polydisciplinary Faculty of Safi (FPS).
2010 - 2014 Deputy director of the "Environment and Health" research team at the FPS.
2009 - 2013 Pedagogical coordinator of the SVI section at the FPS.
2007 - 2014 Member of the scientific council of the Natural sciences department at the FPS.

2007 - present	Co-founding member of the Moroccan Society of Immunology (SMI).
2011 - present	Secretary General of the Moroccan Society of Immunology (SMI).
2017 - present	Treasurer of the "Federation of African Immunological Societies "FAIS"
2018 - present	Member of the Editorial Board of several international journals: BMC Immunology; Molecular Pathology and Biochemistry; Iore Journal of Immunology; Journal of Vaccines, Immunology and Immunopathology; Open Immunology Journal; Clinics in Oncology Research and International Journal of drug design development.

D. Grants and honors

Ongoing grants:

2021 - 2025	Co-recipient, Mo**B**ility for **R**esearch and **A**frican **IN**tegration through Health **S**ciences **"BRAINS",** awarded by the EU, **€ 1 399 800**
2021 - 2023	Principal recipient, Al Khawarizmi program, prediction of precision therapy via artificial intelligence in cancer patients. **€ 200 000**
2021 - 2023	Principal recipient, "Morocco-Tunisia partnership", Cancer immunotherapeutic through selected natural molecules, **€ 30 000**
2019 - 2022	Principal recipient, PPR research grant from the "Moroccan ministry of research", "Bio-engineering of nanobodies for immunotherapy of cancer", **$ 310 000**
2020 - 2021	Co-recipient, research grant from the UH2C, "Biomedical and bioengineering aspects of cancer", **$ 220 000**
2016 - 2019	Co-recipient, UH2C grant support for "LPCM" Lab, **$ 87 000**

Awards and honors:

2003-2004	Polard Memorial Fellowship Award of the Arthritis National Research Foundation.
2020	Certificate of appreciation awarded by the National Radio and Television Company for active participation during COVID-19 pandemic.
2020	Over 100 invitations, as researcher in Immunology, by the media (radio, television and newspapers).

Past grants:

- Principal recipient, **PHC Toubkal "France-Morocco partnership", € 30,000**	2016 - 2018
- Grant Erasmus Mundus Action 2, Lot Fatima AL FIHRI lot 1	2014
- Research Grant from « Boehringer Ingelheim Pharmaceuticals, Inc »	2005-2007
- Research Grant from « Arthritis National Research Foundation»	2003-2004
- Postdoctoral Fellowship from « Fondation pour la Recherche Medicale »	1999-2000
- Postdoctoral Fellowship from « SIDACTION (ensemble contre le SIDA) »	1998-1999
- Doctoral Fellowship from « Fondation pour la Recherche Médicale »	1997-1998
- **Doctoral Fellowship** from « Association de la recherche pour le cancer »	1996-1997

E. Contributions to Science.

- Mechanisms of HgCl2-induced Th2 lymphocyte activation and autoimmunity.

Mercuric chloride (HgCl2) induces T helper 2 (Th2) autoreactive anti-class II T cells. These cells produce IL-4 and induce a B cell polyclonal activation that is responsible for autoimmune disease. HgCl2 triggers early IL-4 mRNA expression both in vivo and in vitro by T cells, which may explain why autoreactive anti-class II T cells acquire a Th2 phenotype. We have contributed to understanding the transduction pathways by which this chemical operates. We have shown a series of evidence for the involvement of Cav1 channels in this process. Furthermore, we have shown that Cav1 channels might be implicated also in the TCR-mediated T lymphocyte activation. However, at this stage, we have used mainly inhibitory chemicals.

1- **Badou A**, Savignac M, Moreau M, Leclerc C, Foucras G, Cassar G, Paulet P, Lagrange D, Druet P, Guery JC, Pelletier L. Weak TCR stimulation induces a calcium signal that triggers IL-4 synthesis, stronger TCR stimulation induces MAP kinases that control IFN-gamma production. **Eur. J. Immunol**. 2001 Aug;31(8):2487.
2- Savignac M, **Badou A**, Delmas C, Subra JF, Cramer SD, Paulet P, Cassar G, Druet P, Saoudi A, Pelletier L. Gold is a T cell polyclonal activator in BN and LEW rats but favors IL-4 expression only in autoimmune prone BN rats. **Eur J Immunol**. 2001 Aug;31(8):2266-76.

3- **Badou A**, Savignac M, Moreau M, Leclerc C, Guery JC, Paulet P, Druet P, Ragab-Thomas J, Pelletier L. Protein kinase C-mediated calcium entry dependent upon dihydropyridine sensitive channels: a T cell receptor-coupled signaling pathway involved in IL-4 synthesis. **FASEB J**. 2001 Jul;15(9):1577-9.
4- **Badou A**, Savignac M, Moreau M, Leclerc C, Pasquier R, Druet P, Pelletier L. HgCl2-induced interleukin-4 gene expression in T cells involves a protein kinase C-dependent calcium influx through L-type calcium channels. **J. Biol. Chem**. 1997 Dec 19;272(51):32411-8.

5- Bridoux F, **Badou A**, Saoudi A, Bernard I, Druet E, Pasquier R, Druet P, Pelletier L. Transforming growth factor beta (TGF-beta)-dependent inhibition of T helper cell 2 (Th2)-induced autoimmunity by self-major histocompatibility complex (MHC) class II-specific, regulatory CD4(+) T cell lines. **J. Exp. Med**. 1997 May 19;185(10):1769-75.

- Genetic evidence for Cav1 channel role in T lymphocyte activation and pathogenesis.
We have studied how T-cells are activated and could be implicated in pathologies such as autoimmune diseases. We have identified, using genetic approaches, specific proteins, Cav 1, responsible for causing cytokine release. We defined the role of each class of Cav1 channels in T-cell function. Selectively blocking one class of Cav1 channels would only partially alter the calcium response, inhibiting the activation of cells with limited side toxic effects. We worked to block the activation step, i.e. block the specific calcium channel involved, thereby opening the door for new drugs targeting T-cell activation.

1- **Badou A**, Jha MK, Matza D, Flavell RA. Emerging roles of L-type voltage-gated and other calcium channels in T lymphocytes. **Front Immunol**. 2013 Aug 30;4:243.
2- Mithilesh K. Jha, **Abdallah Badou**, Veit Flockerzi, Marc Freichel, and Richard A. Flavell. Defective Survival and Function of Naïve $CD8^+$ T Lymphocytes in the absence of β3 regulatory subunit of Ca_v channels. **Nature Immunology**. 2009 Dec;10(12):1275-82. Epub 2009 Oct 18.
3- Matza D, **Badou A**, Jha MK, Willinger T, Antov A, Sanjabi S, Kobayashi KS, Marchesi VT, Flavell RA. Requirement for AHNAK1-mediated calcium signaling during T lymphocyte cytolysis. **PNAS**. 2009 Jun 16;106(24):9785-90.
4- Didi Matza*, **Abdallah Badou***, Koichi S. Kobayashi, Karen Goldsmith-Pestana, Yutaka Masuda, Akihiko Komuro, Diane McMahon-Pratt, Vincent T. Marchesi and Richard A. Flavell. A Scaffold Protein, AHNAK, Is Required for Calcium Signaling during T Cell Activation. **Immunity**. 2008 Jan; 28: 64-74. ***equal contribution.**
5- Abdallah Badou, Mithilesh K. Jha, Didi Matza, Wajahat Z. Mehal, Marc Freichel, Veit Flockerzi and Richard A. Flavell. Critical role for the beta regulatory subunits of Cav channels in T lymphocyte function. PNAS. 2006 Oct ; 103: 15529-34.

- Study of the tumor microenvironment in cancer patients: Identification of novel therapeutic drugs.
My current research focuses on cancer immunology and Inflammation. We seek to evaluate the immune response in patients suffering from cancer (breast and gliomas) in order to identify targets within the immune cells that could be used to boost the anti-tumor immune response. We combine bioinformatics, drug-protein interaction, molecular approaches. We have established collaborations with surgeons, oncologists, mathematicians and computer scientists. Ultimately, we aim at identifying novel drugs, with limited side effects.

1- Ghouzlani A, Kandoussi S, Tall M, Reddy KP, Rafii S, **Badou A.** Immune Checkpoint Inhibitors in Human Glioma Microenvironment. **Front Immunol.** 2021 Jul 9;12:679425.
2- Ghouzlani A, Rafii S, Karkouri M, Lakhdar A, **Badou A.** The Promising IgSF11 Immune Checkpoint Is Highly Expressed in Advanced Human Gliomas and Associates to Poor Prognosis. **Front Oncol.** 2021 Feb 2;10:608609.
3- Dounia Chraa, Asmaa Naim, Daniel Olive and **Abdallah Badou**. T lymphocyte subsets in Cancer Immunity: friends or foes. **J Leukoc Biol.** 2019 Feb;105(2):243-255.
4- El Khachabi M, Diakité B, Hamzi K, **Badou A**, Senhaji M.A, Nakhchane A, Jouhadi H, Barakat A, Abdellatif Benider A, Nadifi S. Screening of exon 11 of BRCA1 gene using the High Resolution Melting approach for diagnosis in Moroccan breast cancer patients. **BMC cancer.** 2015; 15:81.

Students training activities (2007 to 2021): **31** x Interns/BSc, **22** x Master II, **26** x PhD, **2** x PostDoc and **2** x Medical international students.