

Bassem HASSAN Biosketch

1. Brief CV

PERSONAL INFORMATION

Family name, First name: HASSAN, Bassem

Researcher unique identifiers: <http://orcid.org/0000-0001-9533-4908>,
<http://www.researcherid.com/rid/D-5221-2012>,

• **EDUCATION**

- 1996 PhD: Faculty of Biological Sciences, Department of Molecular Genetics, Ohio State University, USA
- 1989 Bachelor of Science: Faculty of Arts and Sciences, Biology Department, American University of Beirut, Lebanon

• **CURRENT POSITION(S)**

- 01/2019 – Scientific Director: Institut du Cerveau, Paris, France
- 10/2016 – Research Director: Inserm
- 1/2016 – Team Leader: Institut du Cerveau, Paris, France
- 10/2002 – 9/2016 Professor: Faculty of Medicine, Center for Human Genetics, KU Leuven, Belgium
- 1/2016 – Einstein Visiting Fellow: Charité and Free University of Berlin, Germany

• **PREVIOUS POSITIONS**

- 2001 – 2015 Group Leader: VIB, Belgium
- 2010 – 2013 Visiting Scientist: HHMI, Janelia Farm Research Campus, USA
- 1999 – 2001 NIH Postdoctoral Fellow: Department of Human Genetics, HHMI and Baylor College of Medicine, USA
- 1996 – 1999 HHMI Postdoctoral Fellow: Department of Human Genetics, HHMI and Baylor College of Medicine, USA

• **FELLOWSHIPS AND AWARDS**

Group Leader:

- 2019 Roger De Spoelberch Prize
- 2016 Allen Distinguished Investigator
- 2016 Einstein Fellow
- 2009 EMBO member
- 2003 EMBO Young Investigator

Postdoctoral Fellow:

- 1999 – 2001 NIH National Research Service Award Postdoctoral Fellowship

Undergraduate Student:

- 1987 – 1989 The Malcolm Kerr Memorial Scholarship, American University of Beirut
- 1987 – 1989 Faculty of Arts and Sciences Dean's Honor list, The American University of Beirut

• **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

2001 – Present: 3 staff scientists; 11 postdocs; 19 PhD students; 5 Master Students, several of whom are now in leadership positions including two associate professors, a CEO of a company and a VP for clinical research at a major global pharmaceutical company (GSK). Finally, In addition to supporting the careers of excellent young scientists in the field (including ERC holders and EMBO YIPs) such as Stein Aerts (KUL), Emre Yaksi (VIB), Ilona Kadow (MPI), Irene Miguel-Aliaga (UCL), Joris De Wit (VIB), Matthew Holt (VIB), Simon Sprecher (Fribourg), Eugenia Chiappe (Champalimaud) and Nicolas Renier (INSTITUT DU CERVEAU) through various informal activities (reading papers and grants, nominating them for awards...), I have supported the careers of Stein Aerts, Joris De Wit, and Simon Sprecher more directly as the KU Leuven mentor of Stein Aerts, VIB mentor of Joris De Wit and EMBO mentor of Simon Sprecher.

• **INSTITUTIONAL RESPONSIBILITIES**

- 2019 – Scientific Director, Institut du Cerveau
- 2016 – 2019 Leader, INSTITUT DU CERVEAU Education Committee

2010 Chair, VIB Search Committee for NERF Group Leaders
 2005 – 2009 Director, Doctoral program in Molecular and Developmental Genetics
 2008 Chair, VIB Search Committee for new Group Leaders
 2003 – 2005 Vice-Chair, VIB Group Leader Committee
 2003 Chair, VIB Search Committee for new Group Leaders

• **COMMISSIONS OF TRUST**

2017: Medical Research Council (MRC) UK Dementia Research Institute (DRI) evaluation panel
 2016: European Research Council (ERC), Neuroscience and Neural Disorders Consolidator Grant panel
 2015: Paul G. Allen Family Foundation Scientific Charette panel on the next 50 years of biology
 2013 Scientific advisory board: TEFOR infrastructure project, Paris, France
 2013 – Editorial Board member of PLoS Biology
 2012 – 2017 Editorial Board member of EMBO Reports
 2012 – Editorial Board member of Frontiers in Neural Circuits
 2011: Neuroscience Commission: French National Research Agency, Paris, France
 2010: Scientific program review panel: Science Foundation Ireland.
 2009: Scientific review board of CNRS UMR 7637 department, Paris, France
 2009 – 2014 Scientific advisory board, Department of Molecular Biology and Genetics, Bogazici University, Istanbul, Turkey

Ad hoc Journal reviewer: Cell, Science, Nature Genetics, PLoS Biology, Neuron, Current Biology, EMBO Journal, Journal of Cell Biology, Developmental Biology, Mechanisms of Development, BMC-Biology, BMC-Developmental Biology, Journal of Biological Chemistry, Journal of Neurochemistry, Molecular and Cellular Neuroscience, Neuroscience Letters.

Ad hoc Grant reviewer: EMBO fellowship program, EMBO Young Investigator Program, US National Science Foundation (NSF), French National Research Agency (ANR), The Wellcome Trust, UK Medical Research Council (MRC) and Royal Dutch Science Foundation (NWO).

2. Ten-year Track record

The central question of my research is: how does the genome build the brain? Biology is the emergent property of the self-organizing capacity of molecular networks. The most fundamental of these networks is the genome. The most sophisticated is the brain. The genomic network produces a set of instructions that builds the neuronal network. We try to understand what that set of instructions is. Specifically, we deal with the two extremes of neuronal network features. At one end during developmental time, there is cell fate specification. At the other end, there is the formation of precise neuronal connections. Because each neuron is characterized by specific connections, the two features must be linked. Over the past decade, we have made major contributions to understanding these questions. We have unraveled the gene regulatory basis of cell fate specification in the fly retina (Aerts et al., 2009, 2010; Quan et al., 2016). In the process, we linked cell fate commitment in stem cells to tumor suppression (Bossuyt et al., 2009a, b; van Es et al., 2010). On the other hand, we began a long-term effort towards understanding the mechanisms that regulate the specificity, variability and robustness of brain wiring. Our data clearly show that wiring the brain is a more complex and plastic process than has been appreciated in studies using the fly PNS as a model. We have concentrated on how single neurons integrate various attractive and repulsive signals during brain wiring, and how they interact with one another to make wiring choices (Srahna et al., 2006; Langen et al., 2013; Zschaetzsch et al., 2014; Oliva et al., 2016) and how that influences behavior (Linneweber et al., 2020). Many genes that regulate brain wiring are associated with human disease. We have unraveled the roles of the *Drosophila* homologues of the Fragile X protein (Morales et al., 2002; Reeve et al., 2005, 2008; Okray et al., 2015; Franco et al., 2017) and the Amyloid Precursor Protein (Leyssen et al., 2005; Soldano et al., 2013) in axonal growth and guidance. Finally, we have put considerable effort into developing novel computational, genetic and cell biological tools for mapping both genetic networks and neural networks (Aerts et al., 2006; Ayaz

et al., 2008; Choi et al., 2009; Nicolaï et al., 2010). These tools are used by many in the field to deliver novel insights into brain development.

Most significant senior author publications

1. Linneweber GA, Andriatsilavo M, Bias Dutta S, Bengochea M, Hellbruegge L, Liu G, EjsmontRK, Straw AD, Wernet M, Hiesinger PR, Hassan BA. A neurodevelopmental origin of behavioral individuality in the *Drosophila* visual system. *Science*. 2020. 367(6482):1112-1119.
2. Ramaekers A, Claeys A, Kapun M, Mouchel-Viehl E, Potier D, Weinberger S, Grillenzoni N, Cuména1 D, Yan J, Wolf R, Flatt T, Buchner E, Hassan BA. Altering the temporal regulation of one transcription factor drives sensory trade-offs. *Dev Cell*. 2019. 50(6):780-792.
3. Mora N, Oliva C, Fiers M, Ejsmont R, Soldano A, et al. A Temporal Transcriptional Switch Governs Stem Cell Division, Neuronal Numbers, and Maintenance of Differentiation. *Dev Cell*. 2018. 45(1):53-66.
4. Franco LM, Okray Z, Linneweber GA, Hassan BA, Yaksi E. Reduced Lateral Inhibition Impairs Olfactory Computations and Behaviors in a *Drosophila* Model of Fragile X Syndrome. *Curr Biol*. 2017. 27(8):1111-1123.
5. Quan XJ, Yuan L, Tiberi L, Claeys A, De Geest N, et al. Post-translational Control of the Temporal Dynamics of Transcription Factor Activity Regulates Neurogenesis. *Cell*. 2016. 164(3):460-75.
6. Hassan BA, Hiesinger PR. Beyond Molecular Codes: Simple Rules to Wire Complex Brains. *Cell*. 2015. 163(2):285-91.
7. Langen M, Koch M, Yan J, De Geest N, Erfurth ML, et al. Mutual inhibition among postmitotic neurons regulates robustness of brain wiring in *Drosophila*. *Elife*. 2013. 2:e00337.
8. Choi CM, Vilain S, Langen M, Van Kelst S, De Geest N, et al. Conditional mutagenesis in *Drosophila*. *Science*. 2009. 324(5923):54.
9. Quan XJ, Denayer T, Yan J, Jafar-Nejad H, Philippi A, et al. Evolution of neural precursor selection: functional divergence of proneural proteins. *Development*. 2004. 131(8):1679-89.
10. Morales J, Hiesinger PR, Schroeder AJ, Kume K, Verstreken P, et al. *Drosophila* fragile X protein, DFXR, regulates neuronal morphology and function in the brain. *Neuron*. 2002. 34(6):961-72.

Invited talks and invited conference presentations from the last 3 years

- IBENS, Ecole Normale Supérieure, Paris, France (March 2020)
- IBPS-Sorbonne Université, Paris, France (February 2020)
- SfN, Chicago, USA (October 2019)
- University of Trento, Trento, Italy (September 2019)
- University of Zurich, Zurich, Switzerland (June 2019)
- University of Geneva, Geneva, Switzerland (June 2019)
- Plenary talk at 60th Annual *Drosophila* Research Conference (March 2019)
- Yale University, New Haven, USA (May 2018)
- Harvard Medical School, Boston, USA (May 2018)
- King's College London, London, UK (Mar 2018)
- EMBO Neural Development Conference, Taipei, Taiwan (Feb 2018)