BIOGRAPHICAL SKETCH

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NAME: Blinder, Pablo

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

POSITION TITLE: Senior Lecturer (eq to Assistant Professor) of Neurobiology

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 Date MM/YYYY	FIELD OF STUDY
Ben-Gurion University of the Negev, Israel	B.Sc	1999	Biology
Ben-Gurion University of the Negev, Israel	M.Sc.	2001	Ecology
Ben-Gurion University of the Negev, Israel	Ph.D.	2007	Neurobiology
University of California, San Diego	Postdoctoral	2012	Neurobiology

A. Personal Statement

Understanding the intricate relationship between neuronal and vascular networks in the brain has puzzled my for the last ten years, both as a post-doc and now as I lead my own lab. Tacking this aspect of brain structure and function truly requires a multidisciplinary background as my research touches on topics from physiology to the development of novel *in vivo* imaging techniques. I have a formal background in biology which I expanded as a post-doc in the physics department at UCSD where I learned optics, microscopy and a great deal on how to approach complex problems by braking them into smaller, manageable problems. During this time, I took part in the development of a complex set of computational tools to generate and analyze large vascular and neuronal networks. My multidisciplinary laboratory has now expanded the imaging and computational teams and I have recently established a proficient team (post-doc and technician) in molecular and cell biology tools (RNA profiling, FACS, etc). I am very much eager to put all this knowledge and tools to work together to tackle the challenges of decoding the structural and functional interface of the neurovascular unit.

B. Positions and Honors

Positions and Employment

2006–2007	Research Associate, The Biophysical Interdisciplinary Schottenstein Center for the Research and Technology of the Cellome, Bar-Ilan University (ISR)
2007–2011	Post-doc, University of California San Diego, CA
2011–2012	Research Associate, Physics Dept, University of California San Diego, CA
2012-2021	Senior Lecturer (eq. Assistant Professor), tenured, Department of Neurobiology, Tel-Aviv University, Tel-Aviv (ISR)
2021–	Associate Professor, Department of Neurobiology, Tel-Aviv University, Tel-Aviv (ISR)

Other Experience and Professional Memberships

2009–	Member, Society for Neuroscience (SFN)
2010–	Member, The International Society for Cerebral Blood Flow and Metabolism (ISCBFM)
2012-2020	Associate Editor, Journal of Cerebral Blood Flow and Metabolism (Nature Publishing Group)
2014–	Associate Editor, Frontiers in Neuroanatomy
2014–	Associate Editor, Neurophotonics (SPIE)
2015	NSF panelist
2007–	Nature Methods, eLife, Neuroimage, Cerebral Cortex ad hoc reviewer

Honors

1999	Best undergraduate project of the year, Ben-Gurion University
2001	MsC, Magna cum laude, Ben-Gurion University
2002	Kreitman Foundation Doctoral Fellowship
2007	BIKURA for posdoc on interdisciplinary research, Israel Science Foundation Fellowship
2013	Sieratzki Price for Advance in Neuroscience, Tel-Aviv University
2020	Foundation Chateaubriand Fellowship for Research in France

C. Contribution to Science

1. Modulation of microglia activation phenotype. In a completely new brand of research in my lab, I have developed new multidisciplinary approaches for the study of the the role of microglia in different neuropathologies. We have focused on two lines of research: cortical micro-infarcts and brain tumor metastasis. We have significantly teamed up with collaborators worldwide to develop novel tools for the study of brain myeloid cells.

    a. Lubart A, Benbenishty A, Har-Gil H, Laufer H, Gedalyahu A, Assaf Y and Blinder P (2021). Single Cortical Microinfarcts Lead to Widespread Microglia/Macrophage Migration Along the White Matter. **Cerebral Cortex** 31(1):248–266.
    b. Benbenishty A, Segev-Amzaleg N, Shaashua L, Melamed R, Ben-Eliyahu S, Blinder P. (2017) Maintaining unperturbed cerebral blood flow is key in the study of brain metastasis and its interactions with stress and inflammatory responses. **Brain Behav Immun.** (62): 265-276. PMID: 28219803
    c. Benbenishty A, Gadrich M, Cottarelli A, Lubart A, Kain D, Amer M, Glasner A, Erez N,Agalliu D, Mayo L, Ben-Eliyahu s and Blinder, Pablo. Prophylactic TLR9 stimulation reduces brain metastasis through microglia activation. **PLOS Biol**;17(3):e2006859.
    Article highlighted in Nature Cancer Reviews: 1. Baratta MG. Better safe than sorry: a potential prophylactic treatment for brain metastasis. Nat Rev Cancer. 2019
    d. Kim SJ, Kolesnikov M, Peled-Hajaj S, Scheyltjens I, Xia Y, Trzebanski S, Haimon Z, Shemer A, Lubart A, Van Hove H, Chappell-Maor L, Boura-Halfon S, Movahedi K,Blinder P and Jung S (2020). A Binary Cre Transgenic Approach Dissects Microglia and CNS Border-Associated Macrophages. **Immunity**, in press.

2. The cortical angiome - How is the brain organized to provide resources to active neurons is one of the fundamental questions about brain structure and function as it underpins proper brain function and functional magnetic resonance imaging (fMRI). As one of my post-doctorate project, I have reconstructed with a team of researches at UCSD the most detailed map of the cortical mouse vasculature available today. I also contributed to the understanding of micro-stroke development from a structural point of view. Importantly, the mouse vasculature (and potentially the human as well) is not functionally organized map the location of cortical columns, leading the control of blood perfusion to active areas not to the piping diagram but to the direct control through an yet-to-be-defined cellular microcircuitry.

    a. Mestre H, Du T,Sweeney AM, Liu G, Samson AJ, Peng W, Mortensen KN, Stæger FF, Bork PAR, Bashford L, Toro ER, Tithof J, Kelley DH, Thomas JH, Hjorth PG, Martens EA, Mehta RI, Solis O, Blinder P, Kleinfeld D, Hirase H, Mori Y and Nedergaard M (2020). Cerebrospinal fluid influx drives acute ischemic tissue swelling. **Science** 13;367(6483):eaax7171 . PMID: 32001524

b. Uludağ K, Blinder P. (2017) Linking brain vascular physiology to hemodynamic response in ultra-high field MRI. **Neuroimage** 168:279-295. PMID:28254456
c. Blinder P, Tsai PS, Kaufhold JP, Knutsen PM, Suhl H, Kleinfeld D. (2013) The cortical angiome: an interconnected vascular network with noncolumnar patterns of blood flow. **Nature Neuroscience** 6(7):889-97. PMID: 23749145
d. Shih AY, Blinder P, Tsai PS, Friedman B, Stanley G, Lyden PD, Kleinfeld D.(2013) The smallest stroke: occlusion of one penetrating vessel leads to infarction and a cognitive deficit. **Nat Neuroscience**. 16(1):55-63. PMID:23242312

3. Working with a team of collaborators, I have made substantial contribution to the field of Alzheimer's disease, both as a post-doc when I contributed image processing and data analysis to the work by Cohen et al and now as a PI when my laboratory helped to demonstrate using in vivo multi-photon imaging the role of astrocyted in Aβ clearing role.

   a. Cohen E, Paulsson JF, Blinder P, Burstyn-Cohen T, Du D, Estepa G, Adame A, Pham HM, Holzenberger M, Kelly JW, Masliah E, Dillin A. (2009) Reduced IGF-1 signaling delays age-associated proteotoxicity in mice. **Cell** ;139(6):1157-69. PMID: 20005808
   b. Iram T, Trudler D, Kain D, Kanner S, Galron R, Vassar R, Barzilai A, Blinder P, Fishelson Z, Frenkel D. (2016) Astrocytes from old Alzheimer's disease mice are impaired in Aβ uptake and in neuroprotection. **Neurobiol Dis**.96:84-94. PMID: 27544484

4. I have also contributed with the development of novel techniques for *in vivo* imaging as well as data analysis and optics methods. My lab recently contributed a novel open source solution for improving multiphoton microscopy by integrating with easy photon counting tools for ultra fast volumetric imaging. In a different branch of research related to the study of brain metastases, a new frontier of study in my laboratory, we have recently developed a brain-inoculation method that better targets cells to the brain and avoid the perturbation of blood flow. These are key factors in the study of the metastatic process. As a post-doc, I helped to develop a craneotomy to avoid surgery-related inflammation. This is a key aspect that affects both the brain immune system and neurons. The use of this window avoid these confounding effects. Other technical developments circled around image analysis tools.

   a. Har-Gil H, Golgher L, IsraelS, Kain D, Cheshnovsky O, Parnas M and Blinder P. PySight: plug and play photon counting for fast continuous volumetric intravital microscopy. **Optica**, 2018; 5 (9): 1104 DOI: 10.1364/OPTICA.5.001104
   b. Tsai PS, Blinder P, Squier JA, Kleinfeld D. (2013) All-optical in situ histology of brain tissue with femtosecond laser pulses. **Cold Spring Harb Protoc.** (4):327-34. PMID:23547156
   c. Drew PJ, Shih AY, Driscoll JD, Knutsen PM, Blinder P, Davalos D, Akassoglou K, Tsai PS, Kleinfeld D. (2010) Chronic optical access through a polished and reinforced thinned skull. **Nat Methods**. 7(12):981-4. PMDI: 20966916
   d. Drew PJ, Blinder P, Cauwenberghs G, Shih AY, Kleinfeld D. (2010). Rapid determination of particle velocity from space-time images using the Radon transform. **J Comput Neurosci**.;29(1-2):5-11. PMID: 19459038

Complete List of Published Work in My Bibliography:

PubMed
ORCID 0000-0002-4042-214X

D. Research Support

Ongoing Research Support

Israel Science Foundation no. 2342/21 10/01/21–09/30/26
Revealing the identity, activation state and role played by phagocytic brain macrophages populating the white matter following cortical microinfarcts
The goal of this project is to provide an extensive mapping of the neurovascular interface
Role: PI

European Research Council - ERC-PoC 101066138 01/10/2022 – 30/03/2024
A Real-time imaging and classification system for low-grade glioma detection during brain surgery
Role: PI

ERA-NET ImmuneHyperCog 01/04/2021–30/03/2024
Prevention of Vascular Cognitive Impairment through Early Detection of Cardiovascular Diseases
Role: Co-Investigator

European Research Council - ERC-PoC 899839 01/10/2020 – 30/03/2022
PySightBox: A cost-effective, out-of-the-box photon counting platform for multi-photon *in vivo* microscopy applications
Role: PI

Leducq Transatlantic Network of Excellence on cardiovascular research no. 1019/15 10/01/15–09/03/22
Evoked Neuronal Activity: A New Therapy for Acute Ischemic Stroke?
The goal of this project is to test (both in animal models and in humans) the potential protective effect of sensory stimulation as part of the treatment of ischemic stroke during its acute phase
Role: Co-Investigator

Completed Research Support

European Research Council - ERC-StG 639416 06/01/15–05/31/21
Quantifying the structure-function of the neurovascular interface: from micro-circuits to large-scale functional organization
The goal of this study is to study in a correlative fashion *in vivo* and ex vivo dataset across different spatial scales
Role: PI

Israel Science Foundation no. 1019/15 10/01/15–09/30/21
Decoding the neurovascular response within its multi-scale functional anatomical framework
The goal of this project is to provide an extensive mapping of the neurovascular interface
Role: PI

NIH R21 EY 029450 9/01/18–08/31/20
Decoding the neurovascular response within its multi-scale functional anatomical framework
The goal of this project is to develop novel optogenetic tools to control vasoactive neuropeptide release
Role: Co-PI (lead)
Bi-national Science Foundation program on transformative science 2014509 04/01/15–03/31/19
Multimodal Whole Animal Physiological Analysis
The goal of this study is to establish the Etruscan Shrew as a new Neuroscience model
Role: Co-Investigator FP7 Marie Curie CIG PCIG13-GA-2013-618251 08/01/13–08/31/17

Vascular Dementia: revealing the detrimental synergy between hypertension, micro-strokes and Neuro-Vascular Decoupling
The goal of this project was to establish a causal link between hypo- and hyperperfusion and changes in neuronal network activity. A manuscript is being prepared
Role: PI eRARE and ISF Ministry of Health E-RARE JTC 2012/3-00000-9608 09/01/12–08/31/15

Dissecting the molecular pathophysiology of Chorea-Acanthocytosis
The goal of this pilot study was to uncover synaptic changes in iPS-derived neurons from healthy and sick patients
Role: Co-PI