BIOGRAPHICAL SKETCH

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NAME: Bandrowski, Anita

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

POSITION TITLE: President

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)	END DATE MM/YYYY	FIELD OF STUDY
UCR, Riverside, CA	PHD	12/2000	Psychology
Stanford University Medical Center, Stanford, CA	Postdoctoral Fellow	12/2004	Neurology and Neurological Sciences

A. Personal Statement

I am a neurophysiologist by training, but for the past decade I have been working in the area of neuro-informatics to increase access to and utilization of neuroscience data. Just as science was able to harness the power of the printing press to foster scientific communication and collaboration, we must now establish the means for communicating and utilizing the digital technologies for scientific communication and discovery. For this reason, I have been working in the area of knowledge representation in the neurosciences within the Neuroscience Information Framework (NIF). I am the scientific lead of the NIF project, which under my direction has grown into the largest source of neuroscience data and tools on the web. Through NIF and my neuroscience background, I have a unique global perspective on issues in data sharing and utilization in the neurosciences and have gained considerable insight and expertise in working with diverse biomedical data. We have recently extended the NIF framework to develop data portals for NIDDK (dkNET) and the RRID community portal. I serve as the lead for the Resource Identification Initiative, a FORCE11, the Future of Research Communications and e-Scholarship, group dedicated to transforming scholarly communication. RRIDs are unique identifiers for Key Biological Resources, aggregated by our group from community databases and requested from authors in participating journals, including Cell, eLife and others. My background in working in Neuroscience data, bioinformatics and ontology development makes me well suited to lead SciCrunch, a technology startup focused on making sense of big biological data.

1. Uhlen M, Bandrowski A, Carr S, Edwards A, Ellenberg J, Lundberg E, Rimm DL, Rodriguez H, Hiltke T, Snyder M, Yamamoto T. A proposal for validation of antibodies. Nat Methods. 2016 Oct;13(10):823-7. PubMed PMID: 27595404.
2. Bandrowski A, Brinkman R, Brochhausen M, Brush MH, Bug B, Chibucos MC, Clancy K, Courtot M, Derom D, Dumontier M, Fan L, Fostel J, Fragoso G, Gibson F, Gonzalez-Beltran A, Haendel MA, He Y, Heiskanen M, Hernandez-Boussard T, Jensen M, Lin Y, Lister AL, Lord P, Malone J, Manduchi E, McGee M, Morrison N, Overton JA, Parkinson H, Peters B, Rocca-Serra P, Ruttenberg A, Sansone SA, Scheuermann RH, Schober D, Smith B, Soldatova LN, Stoeckert CJ Jr, Taylor CF, Torniai C, Turner JA, Vita R, Whetzel PL, Zheng J. The Ontology for Biomedical Investigations. PLoS One. 2016;11(4):e0154556. PubMed PMID: 27128319; PubMed Central PMCID: PMC4851331.
3. Ozyurt IB, Grethe JS, Martone ME, Bandrowski AE. Resource Disambiguator for the Web: Extracting Biomedical Resources and Their Citations from the Scientific Literature. PLoS One. 2016;11(1):e0146300. PubMed PMID: 26730820; PubMed Central PMCID: PMC5156472.
4. Bandrowski A, Brush M, Grethe JS, Haendel MA, Kennedy DN, Hill S, Hof PR, Martone ME, Pols M, Tan SC, Washington N, Zudilova-Seinstra E, Vasilevsky N. The Resource Identification Initiative: A Cultural Shift in Publishing. J Comp Neurol. 2016 Jan 1;524(1):8-22. PubMed PMID: 26599696;

PubMed Central PMCID: PMC4684178.

B. Positions and Honors

Positions and Employment

2008 - Project Lead, UCSD, San Diego, CA
2015 - 2015 Project Manager, RanchoBiosciences, Rancho Bernardo, CA
2016 - President, SciCrunch, San Diego, CA

Other Experience and Professional Memberships

1994 - 2015 Member, Society for Neuroscience

Honors

C. Contribution to Science

1. Research Reproducibility: I lead the Resource Identification Initiative, an interdisciplinary group devoted to identification of scientific research resources. The initiative is designed to help researchers sufficiently cite the key biological resources used to produce the scientific findings reported in the biomedical literature. The group spans academia, publishers, funding bodies and commercial tool providers. It is the core principle of this group that reproducibility starts with identifiability and we work with many journals to improve the methods section in each and every paper published by helping authors disambiguate their resources with RRIDs.

    a. Hsu C, Bandrowski A, Grethe JS, Martone M. Assessing value of biomedical digital repositories. [Other]. PeerJ - Preprint2017 January. 11 pages, 197 kB. Available from: https://peerj.com/manuscripts/15479/.
    b. Uhlen M, Bandrowski A, Carr S, Edwards A, Ellenberg J, Lundberg E, Rimm DL, Rodriguez H, Hiltke T, Snyder M, Yamamoto T. A proposal for validation of antibodies. Nat Methods. 2016 Oct;13(10):823-7. PubMed PMID: 27595404.
    c. Ozyurt IB, Grethe JS, Martone ME, Bandrowski AE. Resource Disambiguator for the Web: Extracting Biomedical Resources and Their Citations from the Scientific Literature. PLoS One. 2016;11(1):e0146300. PubMed PMID: 26730820; PubMed Central PMCID: PMC5156472.
    d. Bandrowski A, Brush M, Grethe JS, Haendel MA, Kennedy DN, Hill S, Hof PR, Martone ME, Pols M, Tan S, Washington N, Zudilova-Seinstra E, Vasilevsky N. The Resource Identification Initiative: A cultural shift in publishing. F1000Res. 2015;4:134. PubMed PMID: 26594330; PubMed Central PMCID: PMC4648211.

2. Informatics Tool Building: I build informatics tools and infrastructure to assist biomedical researchers get more from data. This group of papers shows a diversity in platforms, in both data integration as a function of specific data types such as MRI data, across data types such as the neuroscience information framework tool suite, and also the development of ontologies where data integration via semantic means is necessary.

    a. Bandrowski A, Brinkman R, Brochhausen M, Brush MH, Bug B, Chibucos MC, Clancy K, Courtot M, Derom D, Dumontier M, Fan L, Fostel J, Fragoso G, Gibson F, Gonzalez-Beltran A, Haendel MA, He Y, Heiskanen M, Hernandez-Boussard T, Jensen M, Lin Y, Lister AL, Lord P, Malone J, Manduchi E, McGee M, Morrison N, Overton JA, Parkinson H, Peters B, Rocca-Serra P, Ruttenberg A, Sansone SA, Scheuermann RH, Schober D, Smith B, Soldatova LN, Stoeckert CJ Jr, Taylor CF, Torniai C, Turner JA, Vita R, Whetzel PL, Zheng J. The Ontology for Biomedical Investigations. PLoS One. 2016;11(4):e0154556. PubMed PMID: 27128319; PubMed Central PMCID: PMC4851331.
    b. Sivagnanam S, Majumdar A, Yoshimoto K, Astakhov V, Bandrowski A, Martone M, Carnevale NT.

Early experiences in developing and managing the neuroscience gateway. Concurr Comput. 2015 Feb 1;27(2):473-488. PubMed PMID: 26523124; PubMed Central PMCID: PMC4624199.

c. Marenco LN, Wang R, Bandrowski AE, Grethe JS, Shepherd GM, Miller PL. Extending the NIF DISCO framework to automate complex workflow: coordinating the harvest and integration of data from diverse neuroscience information resources. Front Neuroinform. 2014;8:58. PubMed PMID: 25018728; PubMed Central PMCID: PMC4071641.

d. Henry VJ, Bandrowski AE, Pepin AS, Gonzalez BJ, Desfeux A. OMICtools: an informative directory for multi-omic data analysis. Database (Oxford). 2014;2014PubMed PMID: 25024350; PubMed Central PMCID: PMC4095679.

3. Data Sharing: As scientific data becomes more plentiful, it is becoming important to understand current issues around data and data sharing. My contribution to this field is to weigh in as a tool maker and ultimate user of data to point out questions and pitfalls. Addressing the larger questions surrounding data sharing such as standards and tools is critical if scientific data is to move from plentiful to useful.

a. Uhlen M, Bandrowski A, Carr S, Edwards A, Ellenberg J, Lundberg E, Rimm DL, Rodriguez H, Hiltke T, Snyder M, Yamamoto T. A proposal for validation of antibodies. Nat Methods. 2016 Oct;13(10):823-7. PubMed PMID: 27595404.

b. Vita R, Vasilevsky N, Bandrowski A, Haendel M, Sette A, Peters B. Reproducibility and conflicts in immune epitope data. Immunology. 2016 Mar;147(3):349-54. PubMed PMID: 26678806; PubMed Central PMCID: PMC4754615.

c. Ferguson AR, Nielson JL, Cragin MH, Bandrowski AE, Martone ME. Big data from small data: data-sharing in the 'long tail' of neuroscience. Nat Neurosci. 2014 Nov;17(11):1442-7. PubMed PMID: 25349910; PubMed Central PMCID: PMC4728080.

d. Cachat J, Bandrowski A, Grethe JS, Gupta A, Astakhov V, Imam F, Larson SD, Martone ME. A survey of the neuroscience resource landscape: perspectives from the neuroscience information framework. Int Rev Neurobiol. 2012;103:39-68. PubMed PMID: 23195120.

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

1U24MH114827-01, NIH Martone (PI) 09/20/17-08/31/18

A Community Resource for Single Cell Data in the Brain

A detailed census of the structure and role of cell type specific data in the brain is recognized as one of the most promising avenues for advancing our understanding of the human brain in health and disease. The primary goal of this project is to build a foundational community resource for housing single-cell centered data content in the brain. By adopting a three-tiered data, tools, and knowledge paradigm we will lead, together with data generation partners, in the development and deployment of fundamental data models, common community standards, and scientific results to improve our understanding of the diverse cell types in the mammalian brain and its three dimensional organizational logic. This project proposes a unified solution to the development of its resource beginning with a data collection, quantification, and mapping framework for managing data and information across diverse repositories. The first step is to support the acquisition of fundamental data types from data partners by developing the data models and framework for importing structured data into the BRAIN Cell Data Center (BCDC) in consistent data description standards that describe and facilitate best practices for community use of multi-modal single cell data and its content. Toward achieving this end, we will partner with the Neuroscience Information Framework (NIF), International Neuroinformatics Coordinating Facility (INCF), Neuroscience without Borders (NWB), and other standards promoting organizations to leverage and extend existing standards to allow external data contributors to utilize the BCDC. For these data to be coherent, spatial common

coordinate frameworks for mapping are essential, and the project develops and extends Allen Institute Mouse Common Coordinate Framework to enable external mapping of key single cell modalities in a 2D and 3D anatomic context for access and visualization at cell, nuclei, and/or population level. The entire resulting data, tools, and knowledge will be made publicly available in a unified and integrated web-accessible Cell Registry and Portal supporting data retrieval, search, visualization, and analysis of cell specific data and knowledge synthesis. The BCDC front end will provide data feature summaries, tools, and resulting knowledge, and links to raw data and high-resolution images, together with a programmable API/SDK that allows the community to build their own analysis applications and contribute tools. Finally, we will amplify public impact through strong BICCN partnership management, communication, standards committees, and analysis working groups, and develop infrastructure for maximizing community usage, publishing standards and tutorials, and coordinating education and outreach.
Role: KP

OD024432, NIH Bandrowski, Anita (PI) 09/03/17-08/31/18
Sci-Score, a tool to support rigor and transparency guidelines
Standards for scientific methods reporting are absolutely critical to producing reproducible science, but meeting such standards is difficult. Checklists and instructions are tough to follow often resulting in low and inconsistent compliance. To support new standards in methods reporting, specifically the RRID standard for Rigor and Transparency, we propose to build Sci-Score a text mining based tool suite to help authors meet the standard. Sci-Score will provide an automated check on compliance with the RRID standard implemented by over 100 journals including Cell, Journal of Neuroscience, and eLife. Sci-score will provide a score rating the quality of methods reporting in submitted articles, which provides feedback to authors, reviewers and editors on how to improve compliance with RRIDs and other standards.
Role: PI

Completed Research Support

1U24DK097771, NIH/NIDDK (Martone) Martone (PI) 12/01/12-11/30/17
NIDDK Network Coordinating Unit
This project aims at the establishment of the NIDDK Interconnectivity Network Coordinating Center (INCC) to expand and enhance the current NIDDK Consortium Interconnectivity Network (dkCOIN) community and infrastructure, providing seamless access to large pools of data relevant to the mission of NIDDK.
Role: KP

http://helmsleytrust.org/grant/hypothesis-project, Helmsley Charitable Trust Whaley (PI) 11/24/14-11/24/17
The Hypothes.is Project
The Hypothesis Project seeks to enhance research infrastructure by enabling open annotation of web-based documents. The Helmsley grant will help further advance the tools and reach of the Hypothes.is platform through four separate initiatives: Embed annotations into existing publications sources, starting with a pilot program utilizing the Neuroscience Information Framework (NIF) database; Assign broadly accepted Research Resource Identifier coding to components in biomedical research publications (e.g., specific antibodies, genes, data sets, etc.), enabling researchers to access relevant articles and mentions regardless of the fields from which they are published; Create technology that provides authorship credit for annotations, potentially producing an important new forum and incentive for scientists to share their results; and Assess how each of the new technologies described above can be scaled and broadly adopted by scientific publications and contributing authors.
Role: KP

1U24DA039832, NIH/NIDA Martone (PI) 04/15/15-03/31/17
Operation, Support and Strategic Enhancement of the Neuroscience Information Framework
This project manages, maintains and hosts the Neuroscience Information Framework, which is the largest source of neuroscience resources on the Web. The resources include data, databases, software/web-based tools, materials, literature, networks, terminologies, or information that would accelerate the pace of neuroscience research and discovery.
Role: KP

1R24 OD011883-02, NIH/OD Martone (PI) 09/01/12-07/31/16
Semantic LAMHDI Linking Diseases to Model Organism Resources
To establish efficient use of animals as models for human disease or as a means to test therapies/vaccine through development of specific resources for characterizing, archiving and distributing animals and/or resources of use to the biomedical community.
Role: KP

Collaborative Award, NSF Majumdar (PI) 05/01/12-04/30/15
ABI Development: Building A Community Resource for Neuroscientists
To develop a Neuroscience Gateway that will overlay the complexities of accessing and utilizing current cyberinfrastructure / high performance computing environments.
Role: KP