Abstract 9 - Recipient of the 2020 Morris Finlayson Award (Ms. Delaney Cosma)

Abstract: Cortical Dysplasia Teaching Pathology to a Machine

Delaney Cosma[1], Ali Khan[2], Robert Hammond[1,3]

[1]Department of Pathology; [2]Department of Medical Biophysics; [3]Department of Clinical Neurological Sciences Schulich School of Medicine & Dentistry, Western University, London, Canada

doi: 10.1017/cjn.2021.171

Many patients with epilepsy do not achieve adequate pharmacologic control of their seizures and must consider surgical options. Many such patients undergo temporal lobectomy and experience a marked reduction in the frequency and severity of their seizures. However, many are less fortunate. One suspected factor for the latter group is the limited ability of clinical imaging to delineate subtle epileptogenic abnormalities, leading to subtotal resection of lesional tissue. A long range goal in this field is to increase the sensitivity and specificity of detecting such abnormalities by "training" MRI with pathology, feature analysis and machine learning. A key component of this is the ability to segment histopathology to facilitate its mapping to co-registered MRI. A foundational step in this process is to determine whether or not algorithms are capable of detecting the architectural abnormalities in cortical dysplasia on the basis of these segmentations. In brief, reliable semi-automated segmentations were developed to extract a number of features including neuron size, clustering, eccentricity, field-fraction and polarity. Feature analyses using t-Distributed Stochastic Neighbor Embedding (t-SNE) plots demonstrate a non-random association between selected features and diagnostic categories. These results indicate that automated algorithms are capable of distinguishing dysplastic from normal cortex on the basis of semi-automated segmentations.

Learning Objectives

- Describe the value of segmentation in image analysis
- Define the role of feature analysis such as t-SNE in high dimensionality histopathology data

Abstract 10

Presenter: Werner Paulus, University Hospital Muenster, Muenster.

Publishing A High-quality, Non-commercial Neuropathology Journal Without a Publisher: The First Nine Months

Marta Margeta[1], Peter Gould[2], Lili-Naz Hazrati[3], Veronica Hirsch-Reinshagen[4], Werner Paulus[5]

[1]University of California, San Francisco; [2]Hôpital de l'Enfant-Jésus/Université Laval, Québec; [3]Hospital for Sick Children, Toronto; [4]University of British Columbia, Vancouver; [5]University Hospital Muenster, Muenster

doi: 10.1017/cjn.2021.172

Scholarly communication faces increasing economical and ethical challenges, including pricing policies and overbearing behavior of commercial publishing houses. Based on the hypothesis that a diamond open access neuropathology journal of a high scientific and technical quality can be run entirely by neuropathologists, we launched Free Neuropathology (FNP; freeneuropathology.org) in January 2020. Classical publisher activities, such as copyediting, layout, website maintenance, and journal promotion, are undertaken by neuropathologists and neuroscientists using free open access software. The journal is free for both readers and authors, and papers are published under a Creative Commons BY SA licence, where copyright remains with the authors. Based on 26 articles published by August 2020, it takes FNP 11.1 days from submission to first, and 19.9 days to final, decision. High-quality copyediting, layout, and online publishing in the final format is accomplished in only 8 days. Absence of a commercial publisher enables prioritization of democratic and scientifically-driven decisions on editorial structure, website design, journal promotion, paper formatting, special article series, and number of accepted papers. This new model of journal publishing, which returns the control of scholarly communication to scientists, will be of interest to neuropathologists and wider scientific community alike.

Learning Objectives

- Summarize the current state and driving forces behind commercial and non-commercial scientific publishing in neuropathology.
- Describe the advantages and challenges of a non-commercial publishing platform for neuropathology.