

## Neuropathology-A Prominent Tool for Drug Discovery and Development

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### Editorial

*“Pathology, the parent discipline, started with physicians doing autopsies during the Renaissance in Italy to try to understand the reasons for the symptoms and the signs that they had been monitoring”- Juan Rosai, Salt Lake City, UT USA.*

Pathology is a very old discipline that was developed as scientific method for medicine and diagnosis in the Middle East during the Golden Age of Islam (8<sup>th</sup> to 13<sup>th</sup> century) and in Western Europe during Italian Renaissance (14<sup>th</sup> century that lasted until the 16<sup>th</sup> century). One of the earliest pathologists was Giovanni Morgagni (1682-1771) an anatomist from Padua, Italy who performed more than 600 partial or complete autopsies and organized them anatomically and methodically to correlate with the symptoms shown by the patients before death [1].

The advent of modern pathology was invented by German Scientists Rudolf Virchow (1821-1902) who is also recognized as father of the microscopic pathology worked in Humboldt University of Berlin, Germany. Virchow was one of the first prominent physicians to understand the manifestations of disease could be visible only at the cellular level [2]. One of his students Julius Cohnheim (1839-1884) from Leipzig combined histological techniques with experimental studies on inflammation, making him one of the earliest experimental pathologists who also used frozen sections a technique that is widely used by modern pathologists today [3].

Further development of advanced microscopy e.g., electron microscopy, immunohistochemistry, confocal microscopy, fluorescent microscopy and related molecular biology ushered new avenues of investigative pathology to study cellular changes in the tissue or organs in the domain of experimental pathology [4,5].

Joseph Godwin Greenfield (1884-1958) was the first to initiate systematic study of neuropathology in early 20<sup>th</sup> century at the National Hospital, London. He is regarded as the father of Neuropathology [6,7]. His works on cerebrospinal fluid, intracranial tumours, cerebellar ataxias, muscular dystrophies, multiple sclerosis, degeneration of the spinal cord, and other neurodegenerative disease further established the field of neuropathology [7].

However, the field of neuropathology was largely limited to the cellular examination of tissues using biopsies from patients for various diseases and still today the neuropharmacological aspects of pathology require further investigation.

The need of the hour is not only to understand pathological diagnoses along with progression and persistence of disease processes but also to unravel the effects of drug treatments and their positive or

negative effects on the cells and tissues using modern pathological techniques e.g., immunohistochemistry, electron microscopy, confocal microscopy and other techniques. Also there is an urgent need to understand the new dynamics of pathology in health and disease. The long-held traditional view that cell and tissues require long time to show changes that can be visualize using neuropathological techniques needs to be revisited. There are now ample evidences that pathological alterations could take place within less than an hour in living tissues and not days or weeks as perceived earlier. Thus, a focal trauma to the spinal cord or brain may lead to frank pathological changes within hours [8,9]. Accordingly, there is a need to study pharmacological manipulation of the changes using pathological techniques to confirm that the given drug or therapeutic agent is effective indeed in real time.

Now-a-days environmental toxins, particulate matters, psycho stimulant drugs, repeated stress or unhealthy life style all could induce neurodegenerative diseases leading to cell and tissue destruction over time. Under such environment the science of pathology is more relevant than before. Nano technological advances made in the last decades affecting medical diagnosis, therapy and/or Nano delivery of drugs for therapeutic purposes further warrant the need to study neurotoxicity caused by these agents using pathological investigations. Thus, the role of modern neuropathology is highly needed now for the successful drug development and therapeutic advances in the clinic.

In this regards OMICS group is doing a great service to the mankind to launch this new venture Journal of Medical & Surgical Pathology for the advancement of the field and better care of the patient in future. We are sure that this new journal could soon become an important point of reference to the clinicians, pharmacologists, pathologist, policy makers and healthcare specialist for better clinical practices and novel therapeutic strategies. We also hope that the journal will soon acclaim a prominent position in the comity of other Pathological journals in the near future!

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