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Quality assurance of the histological findings in forensic and hospital autopsies: Measuring quantities without bias with stereological analysis

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It is not surprising that not all conventional histological investigations are essentially needed in autopsy practice. Fine tissue diagnosis often yields the additional information that may enable an expert's opinion to satisfy the strict standards of proof in criminal law or make a crucial contribution when convincing a court of law. The pathology team involved in this practice will need to make decisions about methods that will lead to both scientifically and legally relevant insights. Even with the numerous advances in diagnostic modalities, autopsies continue to demonstrate diagnostic errors that can affect clinical outcomes or in the context of inculpating or exculpating a suspect. The non-confirmatory histopathology report, in the case of an evident pathology at the autopsy, creates undesirable contradictions in the opinions from experts and a high inter-observer variability, and it could provide a valid ground to get some legal benefit by the accused party. Pathologists rely on 2-D cell profile counts to assess effects on the quantitative profile of cells in quantitative histopathology, but because this is an assumption-based measurement, it introduces some uncontrollable variability, which is critical to detect subtle morphological changes based on a representative sample of tissue. In order to recapitulate the cellular and micro environmental complexity of the tissue sample within a native 3D architecture, design-based stereology should be used to perform unbiased measurements, even when the tissue exhibits striking anisotropy (e.g. myocardium). Our aim is to highlight the possibilities of using a relevant diagnostic tool in quantitative microscopy in the decision-making processes to microscopic diagnosis.

Biography

Monica Pessanha is the Founder of Myofrastand Inc., and she is an experienced researcher in stereological analysis. Pessanha holds a PhD in Experimental Pathology from the Fluminense Federal University in Brazil, where she investigated the action of a drug that inhibits the nitric oxide synthesis and induces myocardial disarrangement in an experimental model of hypertensive rats. She moved to the US, where she concluded her post-doctoral training at the University of Miami by studying a transgenic mouse model of hypertrophic cardiomyopathy and the quantitative and molecular effects of the presence of the up regulation of histone acetyltransferase p300 in the myocardium. She has a specialization in Entrepreneurial Management and she brings over fifteen years of experience in project planning focus on stereological analysis in biological systems. She is the author and co-author over ten peer-reviewed scientific papers involving stereological analysis.

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