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Digital pathology image analysis: Challenges and opportunities

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The emerging discipline of digital pathology is poised to change the status quo in pathology practice for the better. A pathology department in a medium sized hospital deals with a workload of about 100,000 tissue slides every year, resulting in approximately 50 TB of high-resolution image data, compressed in a near lossless manner, per annum. The sheer size of multi-gigapixel images produced by digital slide scanners poses interesting technical challenges. On the other hand, the heap of image data linked with associated clinical and genomic data is a potential goldmine of invaluable information, as each high resolution image contains information about tens of thousands of cells and their spatial relationships with each other. I will present some of the recent developments in our group concerning digital pathology image analysis and tissue morphometrics from images of cancerous tissue slides. I will then discuss some of the main challenges in digital pathology and opportunities for exploring new uncharted territories.

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Histopathological and biochemical investigations of protective role of honey in rats with experimental aflatoxicosis

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The aim of this study was to investigate the antioxidant properties and protective role of honey, considered a part of traditional medicine, against carcinogen chemical aflatoxin (AF) exposure in rats, which were evaluated by histopathological changes in liver and kidney, measuring level of serum marker enzymes, antioxidant defense systems and lipid peroxidation content in liver, erythrocyte, brain, kidney, heart and lungs. For this purpose, a total of eighteen healthy Sprague-Dawley rats were randomly allocated into three experimental groups: A (Control), B (AF-treated) and C (AF+honey treated). While rats in group A were fed with a diet without AF, B and C groups received 25 µg of AF/rat/day, where C group additionally received 1 mL/kg of honey by gavage for 90 days. At the end of the 90 days experimental period, we found that the honey supplementation decreased the lipid peroxidation and the levels of enzyme associated with liver damage, increased enzymatic and non-enzymatic antioxidants in the AF+honey treated rats. Hepatoprotective and nephroprotective effects of honey is further substantiated by showing almost normal histological architecture in AF+honey treated group, compared to degenerative changes in the liver and kidney of AF treated rats. Additionally, honey supplementation ameliorated antioxidant defense systems and lipid peroxidation content in other tissues of AF+honey treated rats. In conclusion, the present study indicates that honey has a hepatoprotective and nephroprotective effect in rats with experimental aflatoxicosis due to its antioxidant activity.

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