J Cytol Histol 2016, 7:4(Suppl)
http://dx.doi.org/10.4172/2157-7099.C1.009

Probing protein quinary structures by in-cell NMR

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Historically introduced by McConkey to explain the slow mutation rate of highly abundant proteins, weak protein (quinary) interactions are emergent properties of living cells. The protein complexes that result from quinary interactions are transient and thus difficult to study biochemically *in vitro*. Cross-correlated relaxation induced polarization transfer (CRIPT) based in-cell NMR allows the characterization of protein quinary interactions with atomic resolution inside live prokaryotic and eukaryotic cells. We showed that RNAs are an important component of protein quinary interactions. Protein quinary interactions are unique to the target protein and affect physicochemical properties, protein activity, and interactions with drugs.

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An analytical study of histological hazards estimation and comparison between cholecystitis and cholelithiasis by routine, mucin and lipid histochemistry procedures

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The current study emphasizes on routine, mucin and lipid histochemistry procedures to estimate and compare histological hazards in diseased human stone filled and bacterial infections induced hypertrophied gall bladder. 100 normal and 50 (25+25) diseased human gallbladders having cholelithiasis and cholecystitis were chosen for conduction of this study. After proper processing from each sample, three slides were stained by H&E stain, combined PAS-AB stain & Sudan Black B stain respectively for routine, mucin and lipid histochemistry study. In routine histochemistry, predominant histological alterations were estimated and found maximum epithelial discontinuity was 62.5% in cholelithiasis where as 59.09% in cholecystitis. In mucin histochemistry combine PAS-AB stain the supra-nuclear and infra-nuclear part of the epithelium showed intense brownish blue color suggestive of predominant sulfomucin and sialomucin effect (91.91% cases in cholelithiasis, 87.5% cases in cholecystitis). The result of lipid histochemistry indicated accumulation of phospholipids in epithelial cells predominantly in supranuclear region in cholelithiasis. 99.09% scattered lipids were found in other cells and tissues in cholecystitis gall bladder. The basic principle in gall stone formation is accumulation of lipids and hyper secretion of acidic mucin. Sulfomucin enzyme have major role in gall stone generation. Blockage of mucin release can prevent gall stone formation in high risk patients or during high risk period. The compounds which can regulate sialylation and sulfation might help to inhibit gall stone formation & metastasis. This needs further study and entirely new therapeutic approach.

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