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Anatomists Should Underline the Geometry of Some Special Structures

Anatomistler Bazı Özel Yapıların Geometrisini Belirtmelidirler

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ABSTRACT We suggest anatomists to teach the functional anatomy not only by the gross anatomical features, but also combining the 3 dimensional shape and geometry by giving a very important example: the hepatocyte! The hepatocytes are the main liver parenchymal cells that are highly valuable in research purposes. *In vitro* models of hepatocytes would be of great importance to understand the physiological functions of liver and pathological processes of liver diseases. We aim to underline the hypothesis that geometry and functional modulation together with histology and gross anatomy may be linked to functional and pathological properties and stress on the way of learning and also teaching anatomy.

Keywords: Gross anatomy; dissection; hepatocyte; hepatic lobule; hepatic acinus

ÖZET Anatomistlerin, makroskobik özellikler yanında 3 boyutlu anatomi, şekil ve geometri gibi özellikleri belirtmelerinin önemini; hepatosit gibi bir örnekle açıklamak isteriz. Hepatositler, karaciğerin asıl parankimal hücreleri olup, yüksek araştırma değerine sahiptirler. Özellikle karaciğer fizyopatolojilerini anlamada, hepatosit *in vitro* modelleri ile çalışmak oldukça önemlidir. Bu amaçla, anatomiyi öğrenirken ve öğretirken geometri ve işlevsel modülasyonun histoloji ve gros anatomi ile birlikte işlevsel ve patolojik özelliklerle ilgili olabileceği hipotezini ve stresi vurgulamayı amaçladık.

Anahtar Kelimeler: Makroskobik anatomi; diseksiyon; hepatosit; karaciğer lobülü; karaciğer asinüsü

For most of the anatomists, gross anatomy and dissections are corner stones of the medical education. But we know that exponential growth in medical literature and technology have been changing our way of thinking and teaching methods. Gross anatomy education should integrate the traditional and innovative methods today. Development of digital sources like animations, videos, three-dimensional reconstructions help us to deliver more anatomical information during the lectures.[1,2]

Then comes the question: Does the morphology, shape or geometry of a structure draw any attention for the functional anatomy? This is a good question for medical education; combining the knowledge with the conceptualization buy asking the reasons.

Anatomists should underline the geometry of some structures and the liver is a good example: Parenchyme of the liver is very attractive concerning the revision of functional anatomy literature and it plays a crucial role in bile production and metabolism. The hepatocytes that form the critical cell layer between sinusoids and bile canaliculi have a unique polarity with the basal membrane facing the sinusoid endothelium, while apical poles can contribute to several bile canaliculi.[3] Branching and interlocking pattern of polygonal shaped hepatocyte lines increases the metabolic interchange between blood and bile. The hepatic lobule is a hexagone with portal triads at each corner and the liver acinus is a diamond shaped area that has a short axis along the borders of hepatic

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lobules. The systems of lobulation and acinus formation complementing each other prompt the hypothesis that histology dealing with polarity and geometry can be linked to gross anatomy integrating functional modulation.[4,5] This way of learning anatomy makes hepatocytes and liver itself highly valuable subjects of medical and pharmaceutical researches. In vitro models of hepatocyte arrengements would be of great importance to understand the physiological functions and the pathological processes of the liver.

Aim of this letter is to encourage the young anatomists to learn microscopical anatomy with gross anatomy and functional anatomy with pathology to drive researches with the clinicians. In the clinical training courses of the medical education, the staff may involve an anatomist complementing the clinical education with preclinical courses. With curriculum changes and adaptations, anatomy education will continue to develop in parallel to the medical sciences. Increased qualifications of anatomists that can contribute to science and clinics will be the most important outcome of such efforts.

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