Organization of Ventricular Muscle Fibers

The organization of cardiac ventricular muscle fibers has long been recognized as of great importance in our understanding of cardiac function. Recent mechanical studies on isolated papillary muscles and their correlation with associated sarcomere events have reinforced this position. Unfortunately, the fiber arrangement of the ventricles is not easily described. There is a long history of attempts to understand this topic; the work of Robb and Robb1 in 1942 suggested the well-known concept of three relatively independent bands of muscle. The subsequent work of Streeter et al.2-4 has greatly revised our understanding. Streeter et al. showed that the myocardial fibers progressively changed their direction in going from an epicardial to an endocardial location. He initially described the arrangement as a series of "nested-shells."

Our studies,5 as well as the most recent work of Streeter et al.,6 show that his initial description was incomplete. The myocardial fibers simply do not run parallel to the epicardial surface but have a third dimension to their direction. It was with some surprise that I found that our work on this topic of fiber arrangement had been anticipated by Professor Heinz Feneis in his paper, "Das Gefüge des Herzmuskels bei Systole und Diastole," Morphologisches Jahrbuch 89: 371-406, 1943. Unfortunately this work, published in 1943, is not readily available in many good libraries and is in a style of German not easily translatable.

I am writing to bring this work to the attention of your readers. Through the courtesies of Professor Heinz Feneis and Professor Ruthard Jacob of Tübingen, West Germany, I am in possession of both the original printed work and a translation certified by Professor Feneis. I will gladly make copies available upon request.

Arthur F. Grimm, D.D.S., Ph.D.
The Department of Histology
College of Dentistry
University of Illinois at the Medical Center, Chicago
P.O. Box 6998
Chicago, Illinois 60680

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A F Grimm

Circ Res. 1977;40:525
doi: 10.1161/01.RES.40.5.525

Circulation Research is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7330. Online ISSN: 1524-4571

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