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Mapping and ablation of atrial tachyarrhythmias : from signal to substrate

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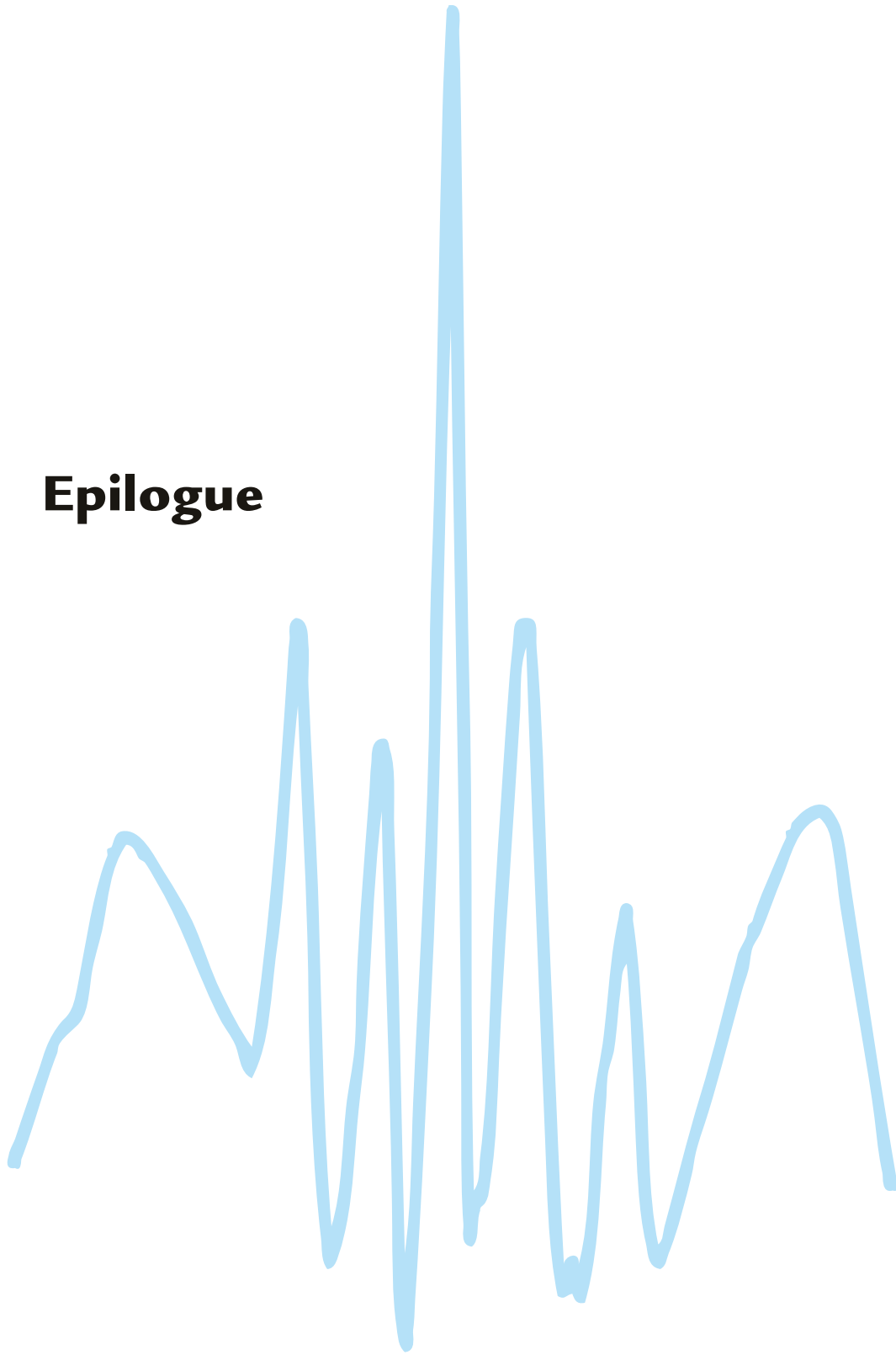
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Epilogue



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This thesis reports the outcome of mapping studies of different types of atrial tachyarrhythmias in humans. Analysis of electrogram morphology and spatial patterns of activation yielded new insights into the pathogenesis of atrial tachyarrhythmias.

Despite the fact that patients with a specific atrial tachyarrhythmia may have common features on the surface electrocardiogram, have the same structural heart disease or have had comparable surgical procedures, the mechanism can be diverse. In patients with similar mechanisms, electrophysiological parameters such as tachycardia cycle length, conduction velocity, conduction anisotropy and fractionation of extra-cellular potentials vary from subject to subject and the location and extension of the arrhythmogenic substrate subsequently also differs between individuals.

As atrial anatomy is assumed to play a role in arrhythmogenesis of atrial tachyarrhythmias, imaging techniques are currently integrated in cardiac electrophysiology in order to create a reconstruction of the macroscopic atrial structure. By superimposing activation/isochronal maps on reconstructions of the atria, patterns of activation are visualized. This facilitates comprehension of arrhythmogenicity and may improve the outcome of ablation procedures.

However, our mapping studies of atrial tachyarrhythmias clearly demonstrated the significance of accurate mapping and detailed analysis of spatial patterns of activation in relation to the morphology of extracellular potentials for localizing areas initiating or perpetuating atrial tachyarrhythmias. Integrated imaging technologies are merely an aid for mental reconstruction of 3-dimensional activation patterns and,

mapping should always be the gold standard for
diagnosing and treating atrial tachyarrhythmias in cardiac electrophysiology.

