OS2-4 慢性心房細動の新たな治療戦略に向けて：in silicoによるリアルタイムPhase Mappingシステムの開発
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A new therapeutic strategy for chronic atrial fibrillation: Development of the real-time phase mapping system using in silico technique
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Rotor ablation has been proposed as the effective treatment for human atrial fibrillation (AF). However, existing mapping systems usually take too much time to visualize activation sequences. Methods: We have developed a novel real-time phase mapping system called “ExTRa Mapping” to detect unstable rotors during AF. Based on bipolar signals of a 20-pole spiral-shaped ring catheter, action potential temporal dynamics was numerically estimated. Results: Unstable rotors during in silico AF were reconstructed by ExTRa Mapping (Fig). ExTRa Mapping could identify unstable rotors during clinical AF by creating phase maps on a real-time basis. Conclusion: ExTRa Mapping could open a new avenue for identifying unstable rotors during AF ablation.

OS2-5 光学マッピングで診たヒツジ心房細動
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Optical mapping of atrial fibrillation in isolated sheep heart
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Atrial fibrillation (AF) is the most common atrial arrhythmia and affects more than 0.8 million Japanese. In the past decade, while several mechanisms (focal discharge and/or rotor, etc.) have been proposed to explain AF initiation and maintenance, AF mechanisms are still debated. We summarize recent high-resolution optical mapping studies in isolated sheep hearts, which have provided new insights into the dynamics and mechanisms of AF. First, we discuss results from experiments on AF induced by acute atrial stretch in the presence of adreno-cholinergic stimulation that revealed the presence of interplay between rotors and focal discharges. Next, we outline the results obtained from a persistent AF model (PtAF) induced by intermittent rapid atrial pacing. By using simultaneous optical mapping of epi- and endocardial activation patterns, we demonstrated that PtAF was maintained by 3-dimensional rotor, a.k.a scroll waves with 1-shaped filaments anchored to junctions between thin and thick myocardium. Thus, these results clearly suggest that self-sustained rotors do exist in the atria and that such rotors are in fact the high frequency sources that determine the complex patterns of activation that characterizes AF.

OS3-1 最近のインターネットにおける脅威について
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Recent Threat on the Internet
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With the widespread of Internet of Things (IoT), various types of devices have been controlled through computer networks. Wireless communications, like Wi-Fi, Bluetooth, NFC, are utilized to collect their status data for efficient management and maintenance. These data are transferred over the Internet in the real time manner. Because some of the data are opened to public, anyone can freely access to them by using Web browser. Although conventional computers can be equipped with sufficient hardware resources, it is mandatory for IoT devices to install the minimum-required hardware resources. The lack of the resources seriously affects to the security level of the devices. As the result, many unprotected devices which are connected directly to the Internet suffer from serious cyber attacks. Sometimes, malicious persons abuse them to steal confidential and/or private data. My speech will discuss the basic points to which we should pay attention by presenting several examples of incidents.