CeMI (iCeMS メゾバイオ１分子イメジングセンター)

The 51st iCeMS SEMINAR

CeMI セミナーシリーズ 15

2010 4. 21（水）

10:30-11:30

講演者： **Kenneth Charles Holmes博士**

マックス・プランク医学研究所
ドイツ　ハイデルベルグ

演　題： **The Molecular Mechanism of Muscle Contraction**

場　所： 京都大学 アイセムス本館 ２階（東一条北西角）
セミナー室（A207）

Skeletal muscle consists of fibre bundles. Each fibre consists of contracting units called sarcomeres in series with each other. The sarcomeres, each of which is about 2.5μ long are made of overlapping sets of thick and thin filaments composed of the proteins myosin and actin. During a contraction the filaments are forced past each other by large numbers of “cross bridges” that reach out from the thick filaments to interact cyclically with the thin (actin) filaments by a kind of rowing action. During this cyclic interaction ATP (adenosine triphosphate) is hydrolysed to ADP (adenosine diphosphate). The cross bridges, which contain the ATP-ase activity, are an N-terminal extension of the myosin molecule that can bind strongly (no ATP bound) or weakly (ATP bound) to actin and can alter shape by rotating a lever-like C-terminal extension (rather like the oar of a rowing boat) after hydrolysing ATP and rebinding to actin. X-ray crystallography, X-ray fibre diffraction and cryo-electron microsopy have yielded atomic structures of this process in a number of different states that have permitted the reaction paths between states to be calculated. As a result the myosin cross-bridge may be described as a four state motor with linkages that ensure that the contractile events (ATP-hydrolysis, actin-binding, power stroke and product release, ATP rebinding and actin release) follow each other in a defined sequence rather like a macroscopic motor.

主　催：京都大学 物質-細胞統合システム拠点（iCeMS =アイセムス）
連絡先：京都大学 iCeMS　原田グループ e-mail: harada-g@icems.kyoto-u.ac.jp