グローバル COE 特別セミナー

生物化学専攻セミナー

日時：平成 20 年 7 月 2 日（水） 16:30～18:00

場所：理学部 3 号館 4 階 412 号室

講師：**Michael B. Yaffe**

Cancer Research, Depts of Biology and Biological Engineering Massachusetts Institute of Technology

演題：**Systems Biology Approaches to DNA Damage Signaling**

要旨：

Many protein kinases along with phosphoserine/threonine-binding domains such as 14-3-3 proteins, WW domains, FHA domains, Polo-box domains, and BRCT domains function together within signaling networks to control growth factor responses, cell cycle progression, the response to DNA damage, and the onset of apoptosis. How signals emerging from these pathways are integrated and processed as a network is unclear. To address this, we have been developing systems models of signaling where kinase activities, protein phosphorylation, binding of substrates to phosphoserine/threonine binding domains, and cellular responses such as cell cycle arrest and apoptosis are quantitatively measured at densely sampled points in time, and related mathematically using partial least squares regression and principal components analysis. We have now applied this methodology to study signal transduction events that control cell cycle arrest and apoptosis in response to DNA damage. Our data indicates that, in addition to the well-established ATM-Chk2 and ATR-Chk1 pathways, p53-defective tumor cells have re-wired the checkpoint signaling network to incorporate the p38MAPK-MAPKAP Kinase-2 pathway as an essential component of the DNA damage response.

世話人：理学系研究科　生物化学専攻　生物情報科学科　黒田真也　（内　24697）

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