## S12-4 Real-time planning of antibiotic dosage base on PK/PD principle

◯Norifumi MORIKAWA[1]

[1]Hiroshima Univ. Grad. Sch. Biomed. Sci.

Pharmacodynamics is concerned with the relationship between drug concentration and antimicrobial effects. Minimum inhibitory concentration (MIC) is a good indicator of the potency of an antibiotic, but says nothing about the time course of antimicrobial activity. PK/PD parameters (e.g. Cmax/MIC ratio, 24-hr AUC/MIC ratio or time above MIC) are major predictors of the in-vivo activity of antibiotics both in animal and man. Time above MIC is the primary parameter correlating with the efficacy of beta-lactam antibiotics. For example, free drug levels need to exceed the MIC for 40-50 % of the dosing interval to obtain good activity with penicillins and cephalosporins. The efficacy of beta-lactoms against organisms with high MICs, such as *Pseudomonas aeruginosa*, can be enhanced by prolonged infusions of 3-4 hours. A lower time above MIC is required for carbapenems (e.g. biapenem and dripenem), because of the more rapid killing of bacteria by these drugs.

The optimal use of PK/PD principle in therapeutic drug monitoring requires knowledge of MIC as well as drug concentrations. Unfortunately most automated susceptibility methods do not give precise MIC. Monte Carlo simulations for target attainment against various pathogens with different drugs and different methods of administration can assist in drug selection for initial empiric therapy. Therefore, we developed a new software for the target attainment against various pathogens with different drugs and different methods of administration used Monte Carlo simulation. Here I would like to introduce the software named "Doctor Omegamon".