Title of PhD project / theme	**Acute severe bleeding – reducing time to treatment.**
Supervisory team	Ian Roberts (LSHTM) Prof Koya Ariyoshi and Professor Osamu Tasaki (Nagasaki)
Brief description of project / theme	Tranexamic acid (TXA) reduces bleeding by inhibiting the enzymatic breakdown of fibrin blood clots (fibrinolysis). Intravenous injection of TXA safely reduces death due to bleeding in patients with trauma and post-partum haemorrhage. In both situations, most deaths occur soon after bleeding onset and delay reduces the benefit. Patients must be treated urgently. TXA is an inexpensive generic drug that is widely available and heat stable. It is highly cost effective. Nevertheless, due to delays getting to health facilities and the lack of emergency transport many patients do not benefit. One key barrier to urgent treatment is the need for an intravenous injection. Health workers able to insert intravenous lines are often unavailable in rural areas and even when they are, securing IV access can be difficult in bleeding patients with collapsed veins. Although TXA is available for oral and intravenous use, there has been little research into alternative routes of administration. Intramuscular (IM) injection would be easier and require less training, but it would take longer to reach the required blood levels. We will examine the bioavailability of TXA after oral, intramuscular, subcutaneous use and conduct pilot studies of alternative modes of administration using fibrinolytic biomarkers as the outcome. This work could lead to the development of a simple auto-injector.
Particular *prior* educational requirements for a student undertaking this project	Clinical experience in trauma care and a sound understanding of epidemiological methods.
Skills we expect a student to develop/acquire whilst pursuing this project	Pharmacodynamics, pharmacokinetics, epidemiology and clinical trials.