Statistics and Actuarial Science Seminar

Title: Personalized prediction of drug response in cancer

Speaker: Yudi Pawitan (Karolinska Institutet)

Date: Wed 25th October 2023 at 3:00PM

Location: E0.32 (beside Pi restaurant)

Abstract: The goal of personalized or precision medicine is to provide a treatment – including type of drug and dosing – that is optimized for each patient according to their personal characteristics. Overall, this is hard to achieve, so across many diseases, most patients end up getting the same treatment. Cancer, however, is different. In addition to tissue specificity, the current molecular techniques can often reveal the specific oncogenic mutation(s) that drive cancer in a specific individual. Theoretically, if (a big if) a cancer depends on a specific driver gene or pathway, a therapy that targets the driver will kill the cancer. Given the wealth of genomic data we can collect on each tissue sample and a wide selection of inhibitors, personalized cancer therapy is becoming increasingly feasible. However, despite some encouraging successes, predicting the therapy response remains highly challenging due to underlying tumor heterogeneity, including natural evolution and potentially multiple drivers. I will describe our efforts in (1) the development of prognostic signature of breast cancer after surgery; (2) searching for driver genes in cancer; (3) the prediction of drug response to acute myeloid leukemia (AML). It's an ideal model to study because of its high molecular heterogeneity; (4) an ongoing investigation of combination therapies, where we try to identify multiple drugs that have synergistic interactions in their effects.