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SEMINAR

"Estimating optimal dynamic treatment regimes from observational studies: can we hope to succeed?"

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**Thursday, 13th December 2007 - h. 16.30
Room 137 - Viale Isonzo 25 - 20135 Milano**

Abstract:

Dynamic treatment regimes are set rules for sequential decision making based on patient covariate history. Observational studies are well suited for the investigation of dynamic treatment regimes because of the variability in treatment and clinic visit timing found in them. This variability exists because different physicians make different decisions in the face of similar patient histories. However, the analysis poses several difficult challenges: i) methods for estimation of treatment effects have to appropriately control for high dimensional time dependent confounders (i.e. time varying risk factors that predict future treatment); standard multivariate longitudinal regression methods which adjust for time dependent risk factors generally yield biased estimators and cannot be used, ii) the determination of an optimal treatment strategy is a high dimensional sequential decision problem; the set of potential dynamic regimes from which to search for the optimal may be very large, iii) the optimal treatment strategy depends on the frequency of the occasions at which decisions can be made, i.e. the clinic visits; yet in observational studies the timing of clinic visits is severely confounded with time varying risk factors and iv) long follow-up observational studies of chronic diseases suffer severely from drop-out. In this talk we examine possible estimation strategies to address these issues and the assumptions under which these strategies should yield valid inference. The estimation, from a large French database, of the optimal CD4 count value at which to start highly anti-retroviral therapy in HIV+ patients is used to illustrate the discussion. This is joint work with Liliana Orellana and James Robins