

**Planning of Bone Marrow Transplantations for Individual Patients:  
Mathematical Models Allow to Think Beyond the Limits of Clinical Trials**

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Transplantation of bone marrow stem cells is a widely used option to treat leukemias and other diseases. Nevertheless this intervention is linked to life-threatening complications. Numerous clinical trials have been performed to evaluate different treatment regimens. Since there exist strong interindividual variations in patients' responses, results of clinical trials are hardly applicable to individual patients. A mathematical model of short term reconstitution after bone marrow transplantation will be proposed and calibrated to patient data. This model allows to simulate different treatment options for large groups of individual patients and to estimate average individual benefits. With this approach it is possible to compare the effect of different treatments on individual patients and to evaluate which variables accessible to clinical trials can be used to plan treatments of individual patients.