This thesis provides novel insights in the use of non-invasive (serum) biomarkers to guide the diagnosis and follow-up, and to predict the severity of disease in patients with inflammatory bowel disease (IBD). Biomarkers can, at this moment, not outclass findings of ileocolonoscopy.

In the second part of this thesis, strategies to optimize safety and effectiveness of thiopurine therapy in IBD patients were provided, specifically by the use of allopurinol as co-therapy or the use of thioguanine as an unconventional thiopurine derivative.

Finally, the pathogenesis and management of two adverse events of thiopurine therapy (myelotoxicity and hepatotoxicity) were described in detail and new viewpoints on the safety of thiopurines as a treatment in IBD were provided.

In conclusion, in this thesis, clinical guidelines for the optimal use of thiopurines were provided.