



## Position by institution 2

**ESR No.** 4  
**Host Institution:** KNAW-CBS Fungal Biodiversity Centre, Utrecht  
**ESR enrolled at:** University of Amsterdam

Institute	KNAW-CBS Fungal Biodiversity Centre, Utrecht
Lab	Yeast and Basidiomycete Research Group
Responsible person	Teun Boekhout, PhD
Job title	Early Stage Researcher: PhD thesis on diagnosis of resistance in yeasts
Job description	<p>Short description:</p> <ul style="list-style-type: none"> <li>- Required degree: BSc (Hons) (e.g. U.K./Ireland), MSc, or equivalent in biology, biochemistry, molecular biology, clinical/molecular microbiology or related subject</li> <li>- Preferred qualification and expertise: (Fungal) molecular biology, knowledge in use of molecular-biological databases, advanced bioinformatics knowledge, knowledge on clinical microbiology</li> <li>- Duration: 36 months</li> <li>- Language: English (essential),</li> <li>- Contact: Teun Boekhout, Tel.: + 31 (0)30 2122600; Mail: t.boekhout@cbs.knaw.nl</li> </ul> <p><b>The Yeast and Basidiomycete Research Group:</b> Yeasts are among the best-studied eukaryotes on earth due to some very well studied species, such as <i>Saccharomyces cerevisiae</i> and <i>Schizosaccharomyces pombe</i>. This, however, covers only a fraction of the known diversity of yeasts. Our research focuses on:</p> <ol style="list-style-type: none"> <li>1. Understanding yeast biodiversity and evolution</li> <li>2. Mechanism of pathogenicity</li> <li>3. Innovative diagnostics</li> <li>4. Fungal biodiversity and ecology</li> </ol> <p><b>PhD project</b></p> <p>Objectives: To investigate polymorphisms in genes involved in resistance and the design of probes to detect them.</p> <p>Methodology: In collaboration with ESR13 (P7) we will explore the expression of specific proteins of resistant and susceptible isolates under conditions of antifungal drugs stress. Bioinformatics analysis will identify biomolecules that correlate with the resistance, and these will be characterized. Comparative genomics, transcriptomics and proteomics (MALDI-TOF MS) will identify markers that are related to the resistance [or the susceptibility]. These will be subsequently explored for the development of diagnostic probes that will be clinically tested by P8 (IMU). In collaboration with partners at Utrecht University (UU) we may also consider biochemical analysis of cell walls and membranes of susceptible and resistant isolates.</p> <p>Expected Results: Set of resistance markers for azole and echinocandin resistant yeasts to be developed in to diagnostic markers. If time allows, use of the diagnostics tools to explore presence of resistance in environmental and clinical isolates.</p> <p><b>Planned secondment(s):</b></p> <p>P7 Bruker (3 months; Y1; to collaborate on MALDI-TOF based diagnostics of resistant isolates); AP1 (1 months; Y1; to learn about optimization algorithms for the development of complex probes targeting multiple mutations); P8 IMU (3 months; Y3; to clinically validate candidate diagnostic markers on resistance). The student will closely interact with the student at CRG, Biotechvana, QVQ, Bruker and Medical University of Innsbruck.</p>