Transnational Access Report

1. General Information

Project Acronym (ID):	POLAPGEN-BIP
Project Title	Developmental aspects of barley drought tolerance
Installation used	IPK_APPP
Name of Group Leader	Anetta Kuczyńska
Name of organization	Institute of Plant Genetics Polish Academy of Sciences

2. Access to the Installation

IPK-APPP

3. Project summary (max. 250 words)

The objectives of the proposed project were:
- to study the reaction of a population of recombinant inbred lines of barley to drought,
- use of image anylsis, bioinformatic and statistical procedures for the extraction of relevant traits describing the drought-tolerant/sensitive phenotype,
- use of standards for image phenotyping data storage and processing.

The plant material consisted of a subset of RILs investigated in POLAPGEN-BD project (www.polapgen.pl) aimed at providing biotechnological tools for production of varieties with improved drought tolerance. In that project barley genotypes were phenotyped in experiments carried out in the greenhouse and in the field. However, because of lack of proper technical equipment, there was no possibility to study their reaction to drought during development, when the treatment is applied, in the way that is possible in modern phenotyping facilities. The proposed project is complementary to investigations in POLAPGEN-BD, but does not overlap with any of its activities. It will provide data necessary for localization of QTLs for developmental traits. In addition to utilization for drawing biological conclusions, the results of the experiment were used in the development of data processing procedures within the FP7 Infrastructure project transPlant (www.transplantdb.eu) in which IPG PAS coordinates a workpackage devoted to standardisation of phenotypic information and computation of sufficient data descriptors, with collaboration of EBI, URGI INRA (Ephesis group), DLO, Biogemma, KeyGene, IPK, GMI, and HMGU-MIPS (some of these groups are actively involved in plant image phenotyping consortia).

4. Main achievements (max. 250 words)

We obtained information which will permit the accurate evaluation of particular RIL lines in their response to drought. In particular, the data of biomass formation will allow us to select lines most susceptible and most resistant to water deficit. These results together with the results of POLAPGEN experiments will be used for identifing regions of the barley genome responsible for drought tolerance. They will be related to the genetic map that has been constructed for this population using 100 SSR and 700 SNP markers. The experiment provided precise characterization of the plants' response to stress during drought, which will permit to define time moments optimal for collecting samples for transcriptome analysis and for proteome and metabolome profiling. The results will be integrated with other outcomes of POLAPGEN-BD project. The data will also be used as working examples in the development of statistical models providing sufficient descriptors for image phenotyping data and of data and metadata standardisation.

5. Publications related to the access granted, acknowledging the support by EC.

To be published