



CDB SEMINAR

Speaker: José António Belo

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**Title: “The AVE and the Cerberus-like genfamily:
searching for new players establishing
a symmetries in the early mouse embryo.”**

Date: Tuesday, February 10

Place: 7th floor Conference Room of Building A, CDB

Time: 15:00 P.M. ~ 16:00 P.M.

Abstract:

Several reports point to an involvement of the mouse Anterior Visceral Endoderm (AVE) in early anterior neuroectoderm induction. Several secreted antagonists of BMP4, Nodal and Wnt8 pathways, like Cer-1, Lefty1 and Dkk1 are expressed in the AVE, in a region underlying the prospective anterior neuroectoderm, and shown to play an important role in head formation.

In order to further characterize the molecular mechanisms that play a role in the early forebrain induction, a transgenic mouse line was generated in which EGFP is expressed in the AVE, under the control of the promoter region of the Cer-1 gene. This allowed us to microdissect the anterior-distal (Ad) region and the diametrically opposed proximo-posterior (pP) region of the E5.5 mouse embryo. Gene expression profiling of both Ad and pP regions using GeneChips® (Affymetrix®) identified differentially expressed transcripts at the very early stages of A-P axis establishment. Using another approach, by sequence homology analysis, we have identified a novel mouse gene of the Cerberus-like family, that we designated cerberus-like 2 (cerl-2). This secreted molecule is only expressed at the perinodal region between E7.0-8.0. In *Xenopus* assays, cerl-2 mRNA is able to fully mimic the activity of Xcer including the induction of ectopic head-like structures as Xcer does. Inactivation by homologous recombination in ES cells demonstrated that cerl-2 is involved in the correct establishment of the left/right body asymmetry during embryonic development. Biochemical, functional and genetic analyses uncovered the cerl-2 mechanism of activity, which is crucial for the genetic pathway determining the left-right asymmetry.

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