



## CELSA - Collaborative research project - Application form - COVER PAGE

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### 3. Non confidential and public friendly summary (max. 2000 characters)

**Project title:**

**Uncertainty monitoring in autism: From basic research in young children and dogs to early diagnosis**

**Summary:**

Autism spectrum disorder (ASD) is a prevalent and pervasive neurodevelopmental disorder, the etiology and exact cognitive mechanisms of which are still unclear.

Our aim is to empirically test a new, comprehensive cognitive account of ASD (explaining all affected areas of functioning); to introduce a new animal model (dog) to further test this cognitive account; and (as part of a future EU-funded grant proposal) to develop a diagnostic tool for early detection of ASD.

In four experimental, comparative studies, we will test whether children with ASD and dogs with ASD-like behavioral symptoms react inflexibly to the discrepancies between their expectations (predictions) and the actual inputs (prediction errors). We assume that these children and dogs try to update their cognitive models (learn) even when these errors result from the inherent variability (uncertainty) of the input (noise), while children and dogs without ASD-like symptoms differentiate between reducible and irreducible uncertainty. We hypothesize also that exploration and learning are directed toward stimuli where a medium level of prediction error is expected, but only in children and dogs without ASD-like symptoms.

Our studies contribute to (1) the understanding of the core mechanism underlying ASD symptoms, (2) paving the way for the study of ASD-like cognition and behavior in dogs, which in turn leads to enhanced opportunities to investigate genetic, neurological and pharmacological mechanisms, (3) and the development of an early diagnostic and skill-improving tool for ASD.

### 4. List 5 key words

Autism spectrum disorder, metacognition, uncertainty monitoring, predictive coding, animal model