Case study from Madrid
Biomedical imaging applied to children with attention deficit
M+Visión COFUND

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ERRIN
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  Researcher/fellow: Susanna Carmona
WHAT IS M+VISION COFUND

- Post doctoral **fellowship** program in **biomedical imaging co-funded by EC** (Marie Curie – FP7-PEOPLE-2011-COFUND)
- In collaboration with **MIT**
- For *experienced researchers*
- Including **Trans-national mobility:**
  - Incoming Fellowships (Madrid)
  - Outgoing Fellowships (Boston and Madrid)
WHAT DOES IT OFFER

10 fellowships per year:
- 7 Incoming fellowships
- 3 Outgoing fellowships
WHAT DOES IT OFFER

- **Gross annual salary:**
  - Fellowship 12 months: 43,000 €/year
  - Employment contract 24 months: 65,000 €/year (employer cost)

- **Travel cost coverage:** 3,300€/Fellow-Year

- **Contribution to research costs:** 2,300€/Fellow-Year
WHO CAN APPLY FOR A FELLOWSHIP?

- **PhD or 4 years** research experience FTE
- **Education and experience** in medicine, engineering or other fields **related to biomedical imaging**
- **Mobility** criteria:
  - Incoming fellowships: non residents in Spain for more than 12 months in the previous 3 years
  - Outgoing fellowships: residents in Spain and non residents in US for more than 12 months in the previous 3 years
WHAT ARE THE HOST ORGANISATIONS

**Legal entity** where the researcher carries out the research training activities (years 1 to 3) and that employ the researchers (years 2 and 3), including:

- Universities
- Research Centers
- Hospitals
- Firms
- Other
OPEN CALL FOR APPLICANTS

http://mvisionconsortium.org/mvision-programs/advancedfellowship/

DEADLINE 15TH June 2015
Susana Carmona (Spain): PhD in Cognitive Neuroscience in 2008. She has been Postdoctoral fellow at the Center for Brain Science at Harvard University, Research Consultant at the Cognitive Neuroscience and Information Technology Research Programme at Universitat Oberta de Catalunya, Research coordinator and tutor at the Unitat de Recerca en Neurociència Cognitiva at Fundació Parc de Recerca Biomèdica de Barcelona and Assistant professor at Universitat Pompeu Fabra. Research project: Neural systems implicated in ADHD pathophysiology.
RESEARCH PROJECT

Aim: **Identify candidate biomarkers of Attention deficit hyperactivity disorder (ADHD) that can help us to improve diagnosis, predict prognosis and predict treatment success.**

**What is ADHD?**

- 5-10 % school-age children worldwide
- 35% persist in adulthood
- Symptoms:
  - Hyperactivity
  - Impulsivity
  - Inattention
- 3 Subtypes: Inattentive; Hyperactive; combination of both
- First choice treatment: MPH (Methylphenidate)
- Estimated heritability rate of 76%
- Annual societal “cost of the illness”: 1.041 and 1.529 million euros.

**Overdiagnose => Overmedication**

- % Immature children?
- % Indiscipline children?
- % Low tolerance parents/professors?
RESEARCH PROJECT

Aim: Identify candidate biomarkers of ADHD that can help us to improve diagnosis, predict prognosis and predict treatment success.

- Study 1: Identify potential biomarkers using cSFC (Combined Stepwise Functional Connectivity)
- Study 2: Developmental pattern (prognosis)
- Study 3: Effect of MPH medication (treatment success)
- Study 4: Familiar risk (genetic load)
Analyze the connectivity transitions that take place from primary sensory areas to multimodal association circuits and finally to the higher order cognitive networks.

Participants:
- 120 ADHD
- 120 NTD

Imaging:
- R-fMRI

Procedure:
- 1) Preprocessing
- 2) Seeds
- 3) Whole brain connectivity matrix
- 4) Combined Stepwise Functional Connectivity (cSFC)
  (Sepulcre et al, 2012)
**RESEARCH PROJECT**

Region of interest: Right fronto-insular cortex (VATN) at initial link-step distances

- Deviation from normality
- Delay in brain maturation

**NTD**

**ADHD (med-naïve)**

**ADHD (med)**


Thank you!

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