PUBLICATIONS DO NOT CURE CANCER
Goals of publishing

“Stand on the shoulders of giants”
Issues with “traditional” publishing

• Competition vs. Collaboration
• Limited content
• Slow process from submission to publication
• Not enforcing reproducibility
What is Open Science?

- Open Data
- Open Access
- Open Source

Open Science
Open Access

- Online research free of all restrictions on access
- Free of many (not all) restriction on use
- New business model
- Delayed open-access journals
Open Data

- Enabled by high speed internet
- Heterogeneous data: genomics, environmental, 3D, …
- Not only the input data but also the results and intermediate data
- Datasets are becoming massive
- Data sharing licenses
Open Data – Give a Scan

• The world’s first patient-powered open database for lung cancer research
• 76 patients currently
• www.giveascan.org
Open Data – Visible Human Project

- National Library of Medicine
- Released in 1994
- Color Cryosection, CT and MRI scans
Open Source

- 1985 : Free Software Foundation (FSF)
- 1998 : Open Source Initiative
- Variety of Open Source licenses : BSD, GPL, LGPL, …
- Well known infrastructure: iPython notebooks, Github, …
Open Source - Values

1. Security
2. Affordability
3. Transparency
4. Perpetuity
5. Interoperability
6. Flexibility
7. Localization
Open Source - The Insight Toolkit

- Initiated in 2000 by NLM
- C++ Toolkit for Image Processing
- Over 150 developers
- Over 20,000 users
- BSD (Apache 2) license
Open Science – The Insight Journal

- Companion to the Insight Toolkit
- 600+ papers/ 4000+ readers
- Agile Programming to Agile Publishing
- Enforce reproducible algorithms

www.insight-journal.org
Comparison of Human Ventral Frontal Cortex Areas for Cognitive Control and Language with Areas in Monkey Frontal Cortex

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Summary

Human ventral/dorsal frontal cortex (v/dFC) is identified with cognitive processes such as language and cognitive flexibility. The relationship between it and the vFC of other primates has therefore been the subject of particular speculation. We used a combination of structural and functional neuroimaging methods to identify key components of human vFC. We compared how vFC areas interacted with other brain areas in 25 humans and 23 macaques using the same methods. We identified a core set of 11 vFC components that interacted in similar ways with similar distributed circuits in both species and, in addition, one distinctively human component in ventral lateral frontal area. Fundamental differences in interactions with posterior auditory association areas in the two species were also present—these were ubiquitous throughout posterior human vFC but gathered to different frontal regions in monkeys. Finally, there were some differences in the concertation of interactions with vFC in the two species.

Introduction

The vFC is identified with cognitive processes present in humans such as language and cognitive flexibility. Broca's area is a part of left vFC and is associated with language (Riddoch and Humphries, 2013), whereas other vFC areas, sometimes in the right hemisphere, have been linked to cognitive control—high-level top-down control of behavior—by influencing processing in other brain regions (Von, 2007; Blas et al., 2005; Dewar et al., 2006; Hig et al., 2011; and Neubert et al., 2015).

Despite vFC's identification with such aspects of human cognition, key features of its neural anatomy, such as projection architecture, seem homologous in human and nonhuman primates, such as the macaque (Robsins and Pandya, 2002). A similar homology in neuroanatomy suggests that macaque vFC lacks cognitive skills that humans possess. There is evidence that macaque vFC is involved in auditory processing (R Salvador, 2013), olfactory motor control (Prentice et al., 2005), and gustatory recognition (Rizzio and Stenger, 2010), which might relate to processes necessary for language. However, emphasis has also been placed on macaque vFC's role in multimodal sensory integration (Franklin and Yelland, 2013) and stimulus.
Elsevier – 3D Viewers
Grand Challenges

Overview

The liver is a common site of primary (i.e. originating in the liver like hepatocellular carcinoma, HCC) or secondary (i.e. spreading to the liver like colorectal cancer) tumor development. Due to their heterogeneous and diffusive shape, automatic segmentation of tumor lesions is very challenging. Until now, only interactive methods achieve acceptable results on segmenting liver lesions.

With our challenge we encourage researchers to develop automatic segmentation algorithms to segment liver lesions in contrast-enhanced abdomen CT scans. The data and
The Gain of Open Science

- No repeating experiments
- Building on top of previous science
- Quick knowledge dissemination
- Collaboration = better science
The Cost of Open Science

• Infrastructure costs

• Disruptive change in scientific publishing

• Lack of academic credits

• New technologies adoption

• Security / Privacy
Data Papers

• Scholarly publication of searchable metadata describing datasets

• Considered academic publications

• Data sharing licenses

• Data archiving
Looking Forward

- Open science incentive
- Better education on Open Science
- Open standards
- Improved infrastructure
- Collaboration with publishers
Some more thoughts

- Publishing negative results
- Publishing replication of work
- Enforce reproducibility
- Rethink the modes of publishing online
OPEN SCIENCE CAN HELP CURE CANCER
Thank you for your attention

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