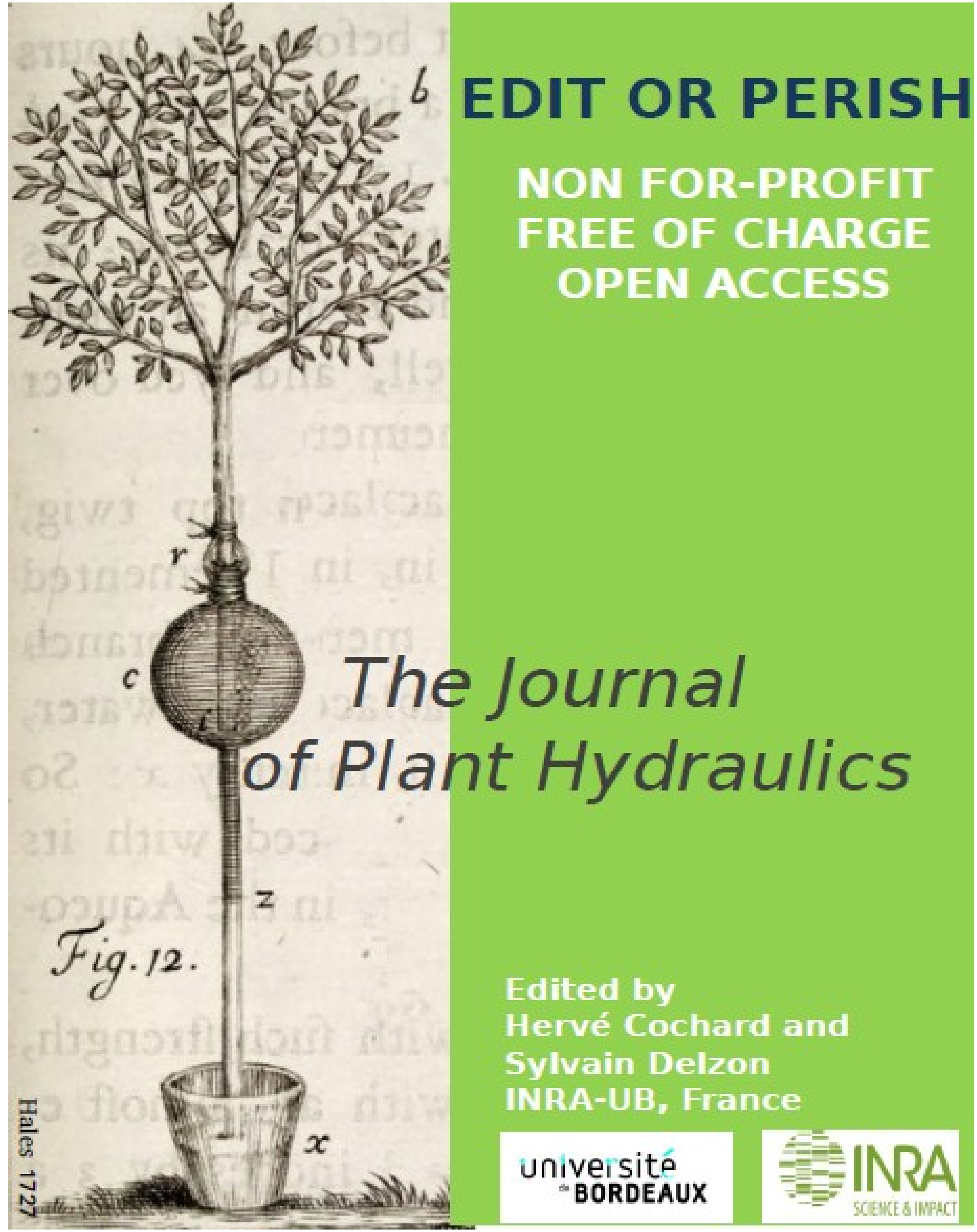
**Sylvain Delzon**
INRA-Bordeaux
(Editor for *Plosone*)

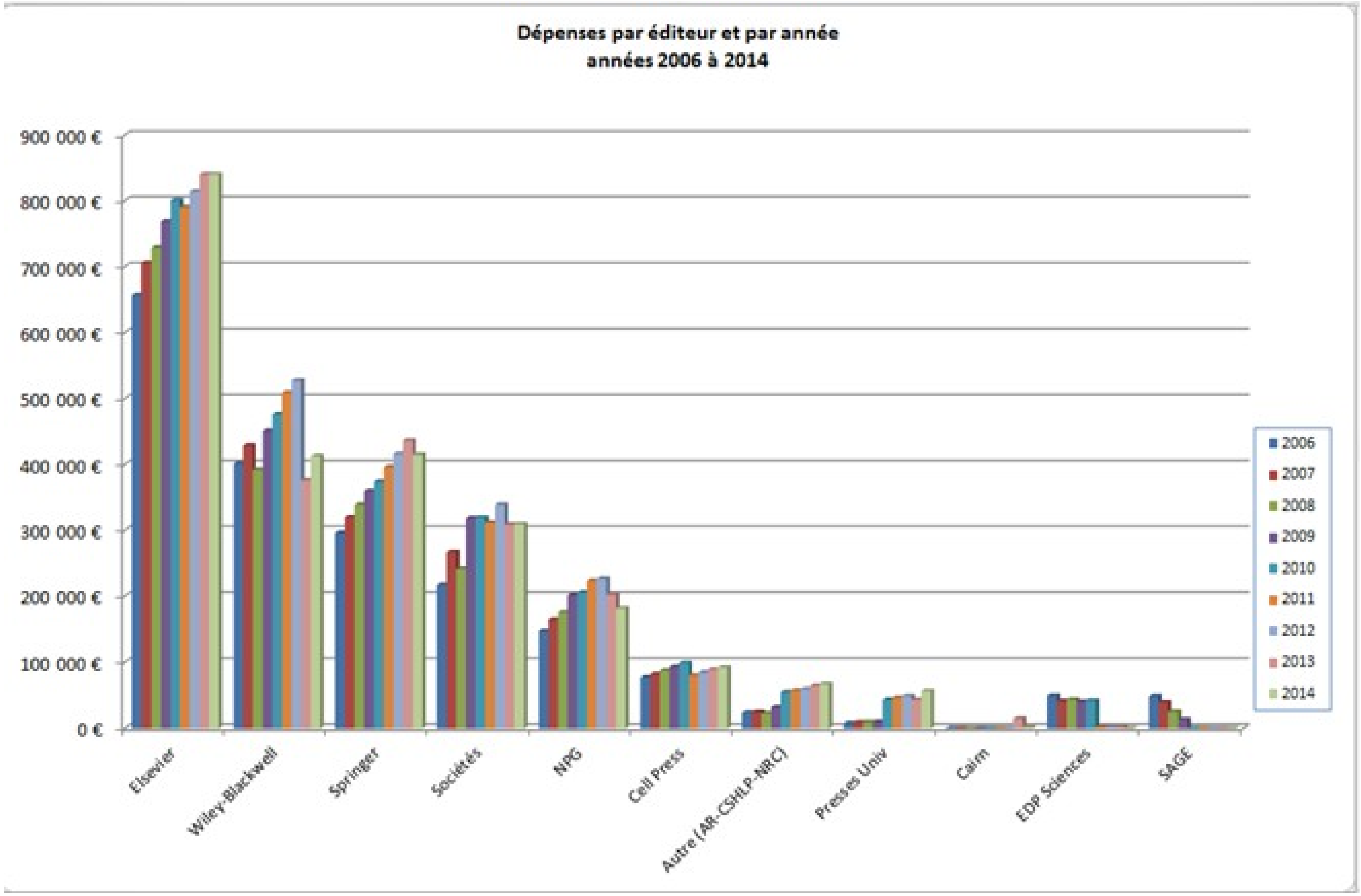
***Chief Editor of the Journal of Plant Hydraulics***

http://jplanthydro.org



# Le contexte

## Evolution des dépenses d’abonnements



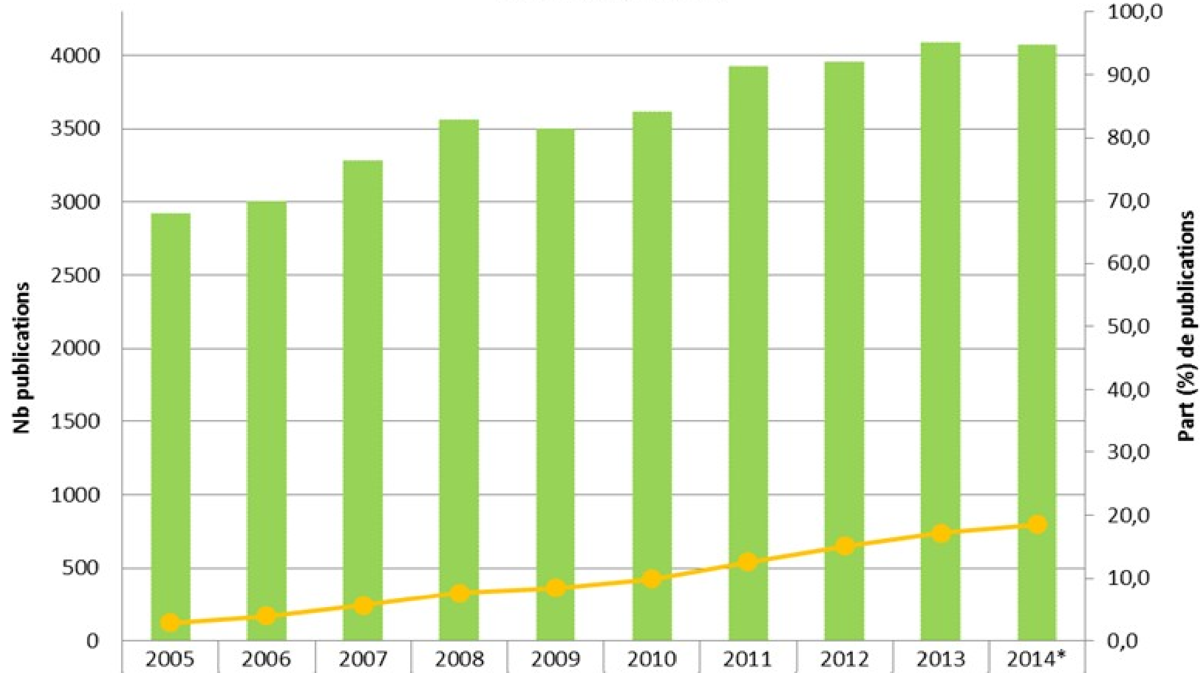

| | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| part des dépenses revues dans les dépenses globales de l'inra | 0,14% | 0,26% | 0,29% | 0,28% | 0,29% |
| Investissement moyen global (revues +BDD) par chercheur | 611,70 € | 977,70 € | 1 122,59 € | 1 179,48 € | 1 281,82 € |
| Budget total | 1 112 690 € | 1 742 261 € | 2 053 222 € | 2 150 189 € | 2 343 169 € |

| 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| 0,28% | 0,29% | 0,30% | 0,29% | 0,30% | 0,27% | 0,27% |
| 1 261,98 € | 1 393,88 € | 1 432,77 € | 1 450,39 € | 1 491,86 € | 1 426,00 € | 1 436,66 € |
| 2 296 795 € | 2 563 345 € | 2 632 000 € | 2 654 207 € | 2 736 078 € | 2 628 122 € | 2 643 449 € |

# Le contexte

## Publications en open access

**Nombre annuel de publications INRA et part de publication en Open Access dans le WoS entre 2005 et 2014***




| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014* |
|---|---|---|---|---|---|---|---|---|---|---|
| Nb publis INRA WoS | 2916 | 3003 | 3283 | 3561 | 3502 | 3611 | 3927 | 3954 | 4088 | 4069 |
| Nb Publis OA WoS | 85 | 120 | 186 | 271 | 295 | 357 | 494 | 598 | 701 | 753 |
| Part (%) de publis en OA | 2,9 | 4,0 | 5,7 | 7,6 | 8,4 | 9,9 | 12,6 | 15,1 | 17,1 | 18,5 |

*Interrogation de la base WoS le 17/02/2015 * année 2014 incomplète*
*Données WoS™ Thomson Reuters - traitements Inra - Février 2015*

- Environ 18% en OA
- PloS One : premier support de publication

**The fees paid by academics to access these publications are excessive**

*(2.7 M€/year for INRA = Annual Budget of INRA-EFPA department)*

**Dilemma : pay to access knowledge or pay to produce knowledge ?**

# Notre philosophie

JPH n'est pas différente des autres revues de par son fonctionnement

Mais de par sa philosophie

(2 points majeurs) :

- Notre modèle économique
- Notre politique éditoriale

# 1- An alternative economical model

8 | Le Monde Mercredi 13 novembre 2013 | SCIENCE & MÉDECINE |

Face aux dangers liés à la concentration de la presse scientifique, **un collectif de chercheurs** préconise la création, par l'Etat, d'un pôle public d'édition en accès libre. La qualité, l'indépendance et l'éthique de la connaissance en dépendent

**La science menacée par une bulle spéculative de l'édition ?**

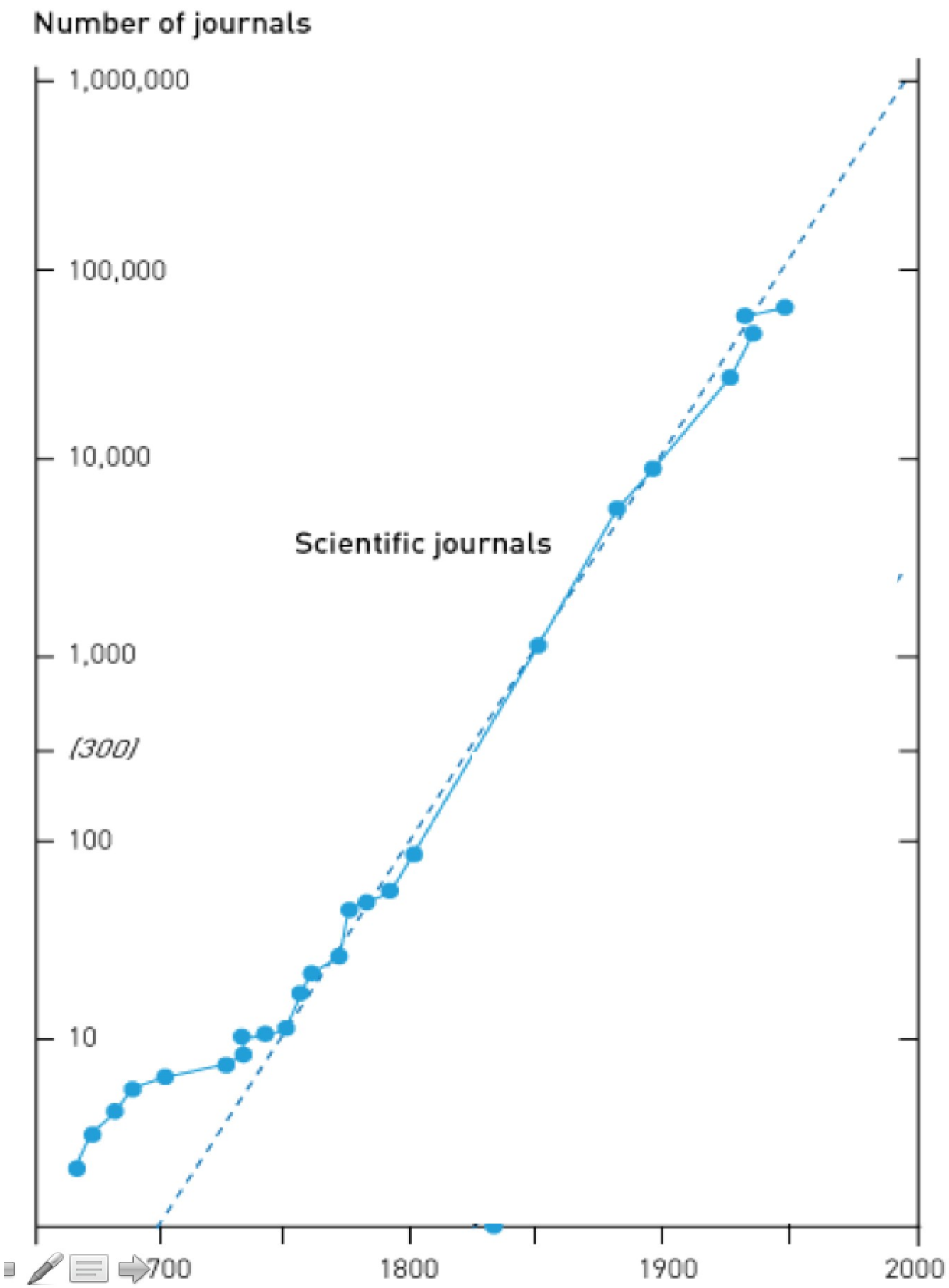
| TRIBUNE |

Scholarly Journals used to be published by non-profit organisations (Universities, Research Institutions, Scientific Societies...)

Scholarly Journals are now in the hands of a few for-profit majors (Elsevier, Springer, Wiley)

| *operating profit* | *company* | *industry* |
|---|---|---|
| 7% | Woolworths | supermarkets, poker |
| 12% | BMW | automobiles |
| 22% | Coca-Cola | adding sugar to water |
| 23% | Rio Tinto | mining |
| 36% | Apple | premium computing |
| 34% | Springer | scholarly publishing |
| 36% | Elsevier | scholarly publishing |
| 42% | Wiley | scholarly publishing |

# Le contexte




**BUT,**
**JPH is not just another journal !**

JPH is an « Experimental » Journal to explore and promote **alternative economical & editorial models**


Thanks to the emergence of *e-publishing* it is now cost-effective for Academic research institutions to re-appropirate its scientific edition

- As authors, editors, referees… academics already cover most the editorial costs
- Institutions could afford to pay for the extra on-line publication cost

**JPH is hosted and published by University of Bordeaux and Idex**

# Modèle économique

*L'objectif est de se réapproprier l'édition scientifique. « Edit or perish »*

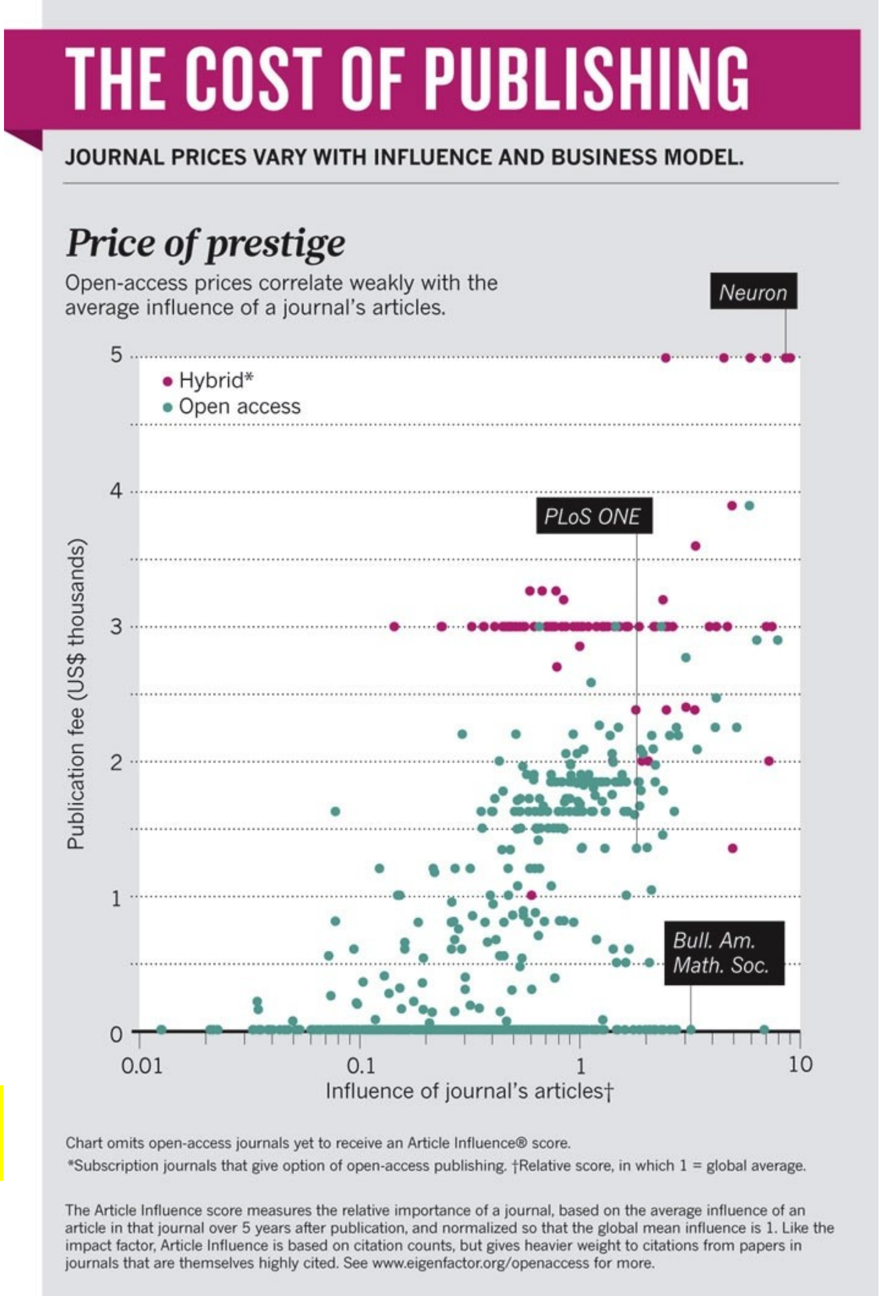
- Non For-profit
  - Open access
    - Free of charge

# 2- An alternative editorial model

**The current editorial model is too corrupted by the « <u>Impact Factor</u> »**

- Impact Factor is a big business issue for for-profit publishers
  *Higher IF = more money*

IF= N citations/N published papers

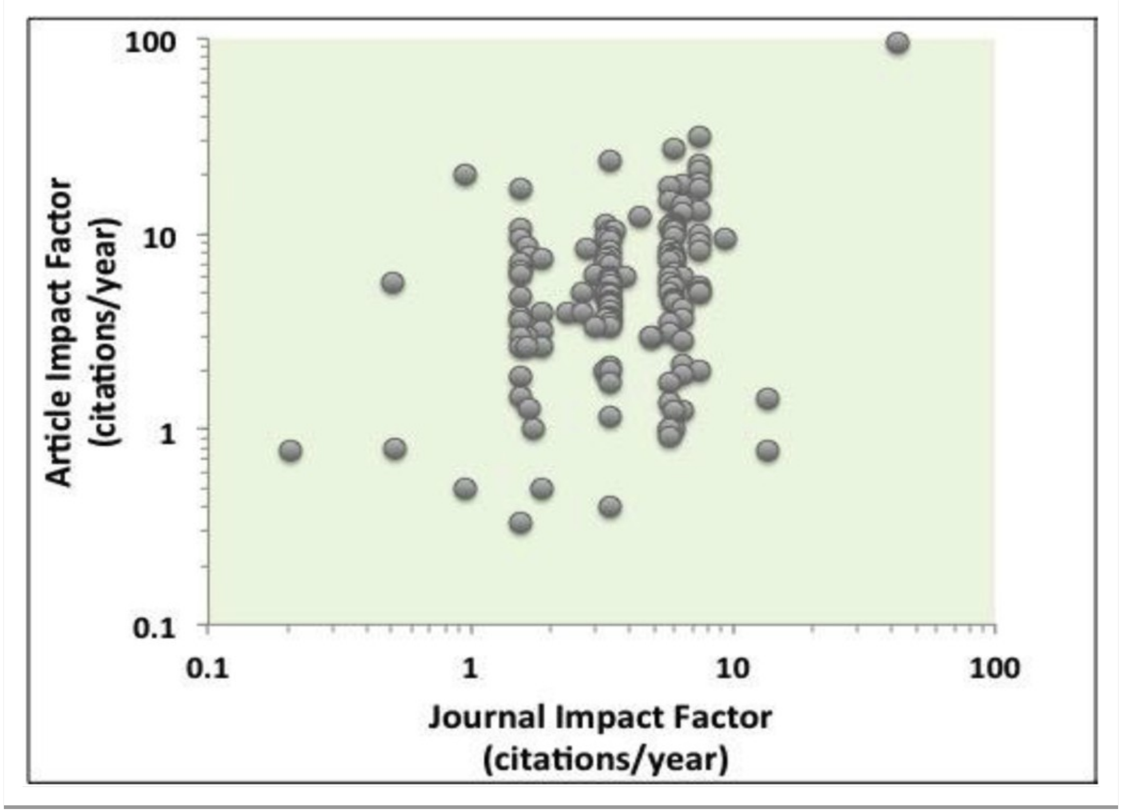


# L'IF n'est clairement pas pertinent

**The current editorial model is too corrupted by the « <u>Impact Factor</u> »**

Impact Factor should not be a scientific issue for researchers

*Higher IF ≠ higher impact*

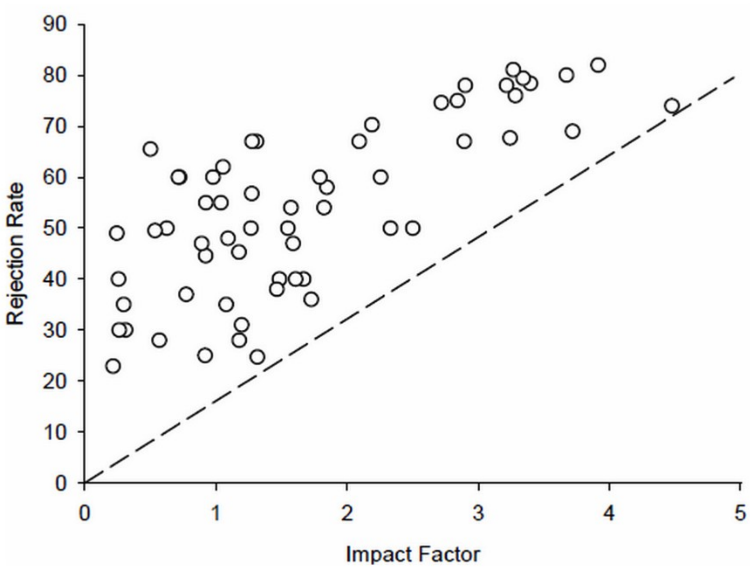


# Another pernicous effects of Impact factor for scientific edition

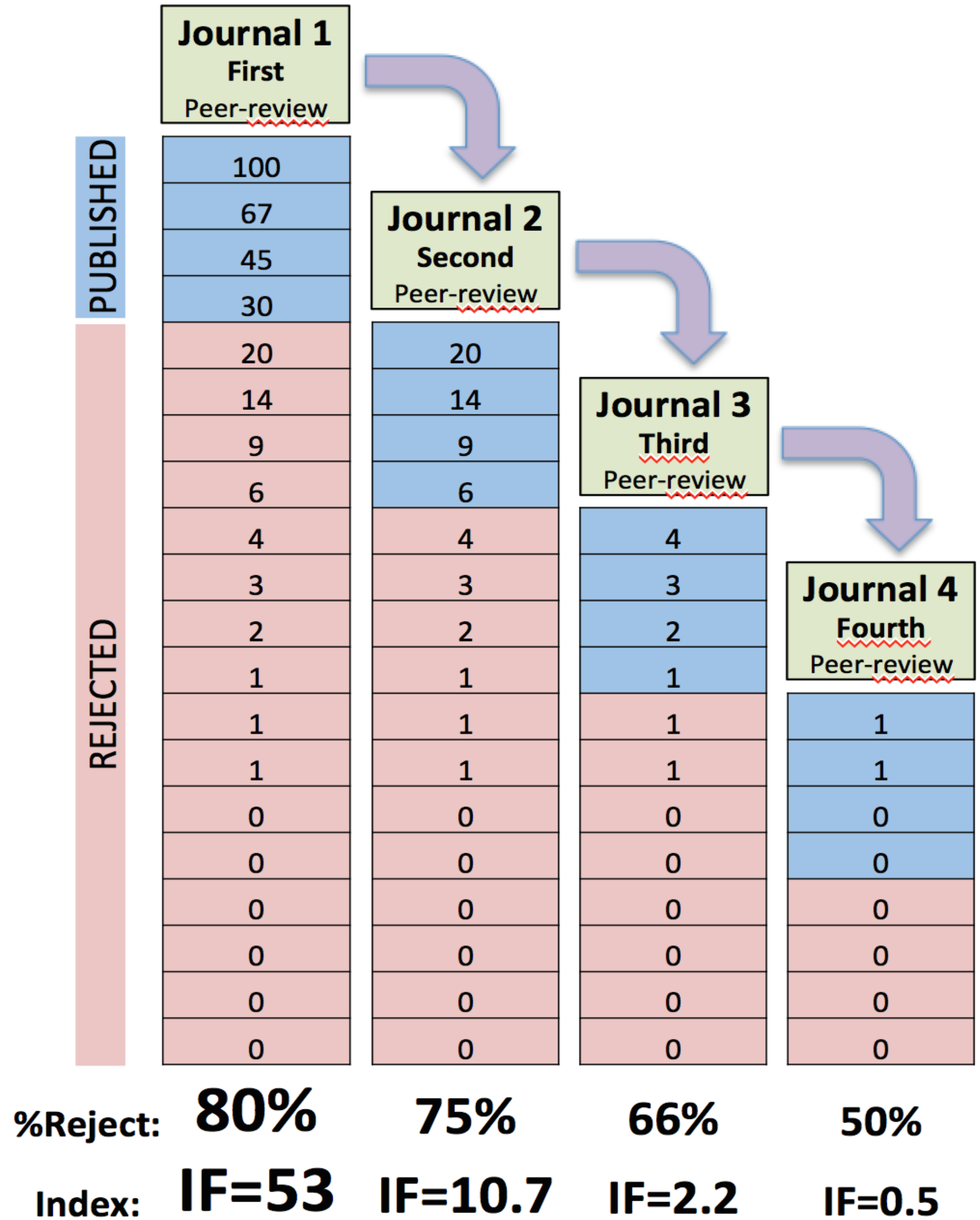
(Cochard & Delzon PLAS 2015)

Maximising IF inevitably encourage journals to publish a small number of arbitrarily selected ‘good’ papers.

*Higher IF = Higher rejection rate*



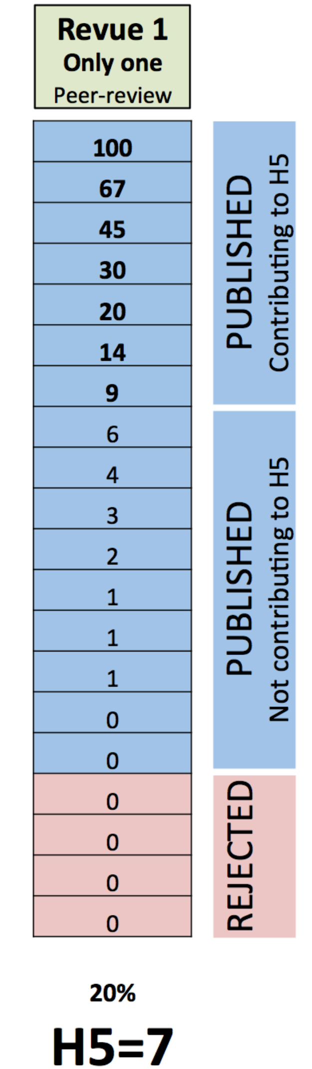

**Saturation of the peer-review system**



J P H
Journal of Plant Hydraulics

## JPH Editorial policy

- We reject the Impact Factor
- We publish all the papers that are judged technically sound and scientifically correct.
- We have no *a priori* on a presumed importance or significance of the science (measured *a posteriori* by the readership on the own articles merit = eg, N citations)
- We are more H5-friendly, a more defendable and less pernicious metric of a journal audience



Google Scholar

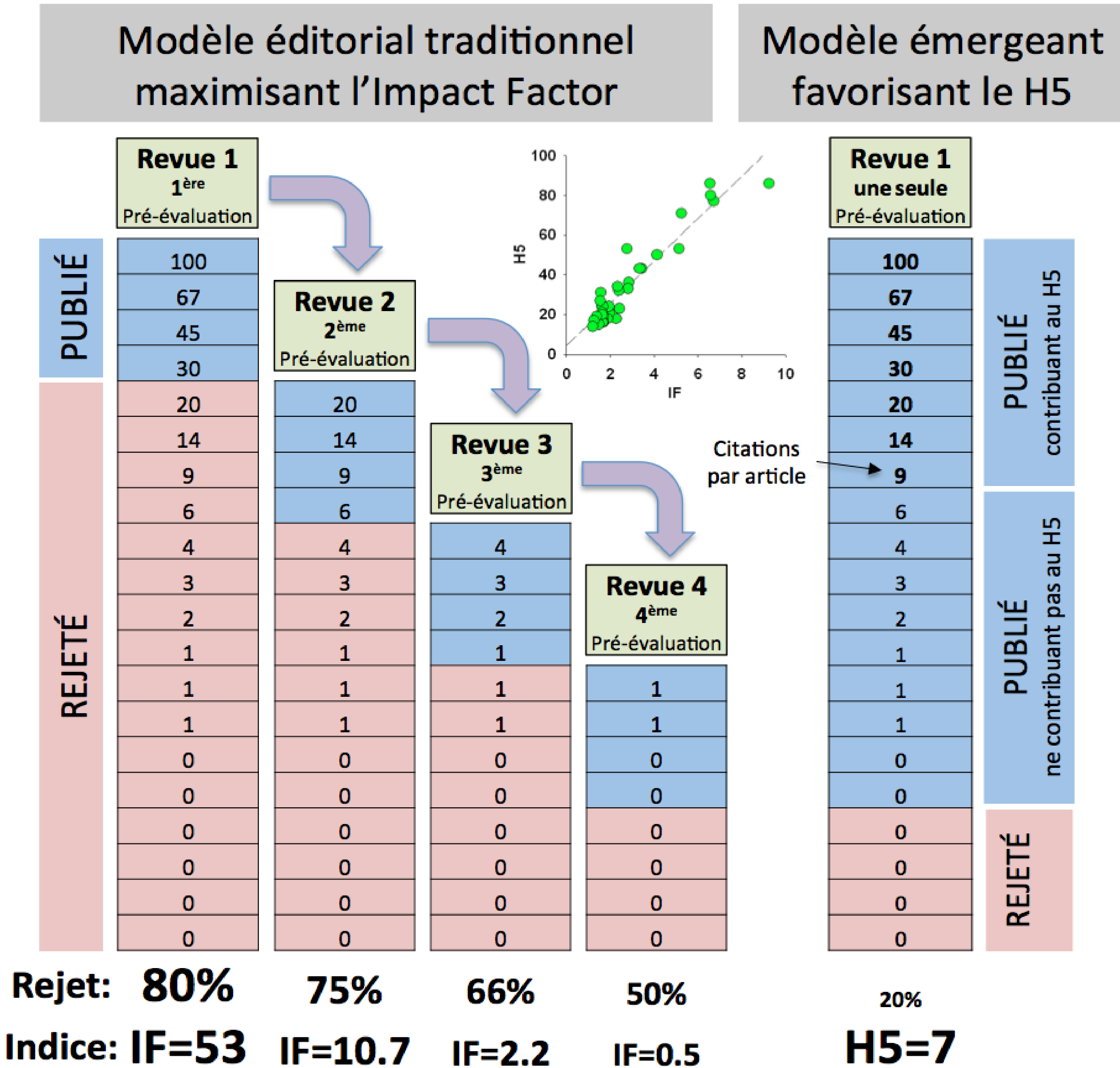
Search Scholar

- English
  - Business, Economics & Management
  - Chemical & Material Sciences
  - Engineering & Computer Science
  - Health & Medical Sciences
  - Humanities, Literature & Arts
  - Life Sciences & Earth Sciences
  - Physics & Mathematics
  - Social Sciences
- Chinese
- Portuguese
- German
- Spanish
- French
- Italian
- Japanese
- Dutch

Top publications - English Learn more

| | Publication | h5-index | h5-median |
|---|---|---|---|
| 1. | Nature | 377 | 529 |
| 2. | The New England Journal of Medicine | 328 | 520 |
| 3. | Science | 316 | 446 |
| 4. | The Lancet | 258 | 415 |
| 5. | Cell | 216 | 330 |
| 6. | Proceedings of the National Academy of Sciences | 216 | 280 |
| 7. | Journal of Clinical Oncology | 202 | 296 |
| 8. | Journal of the American Chemical Society | 199 | 263 |
| 9. | Chemical Reviews | 196 | 351 |
| 10. | Chemical Society reviews | 194 | 282 |
| 11. | Physical Review Letters | 194 | 271 |
| 12. | Advanced Materials | 190 | 262 |
| 13. | JAMA: The Journal of the American Medical Association | 184 | 277 |
| 14. | Circulation | 182 | 278 |
| 15. | Nature Genetics | 182 | 268 |
| 16. | Nano Letters | 181 | 257 |
| 17. | Angewandte Chemie International Edition | 181 | 243 |
| 18. | Nucleic Acids Research | 172 | 296 |
| 19. | ACS Nano | 170 | 255 |

# Mettre les indices à l'index




Very marginal effect on journal ranking audience

Same overall rejection rate

Beneficial for authors, editors and referees (less rejection less reviews)

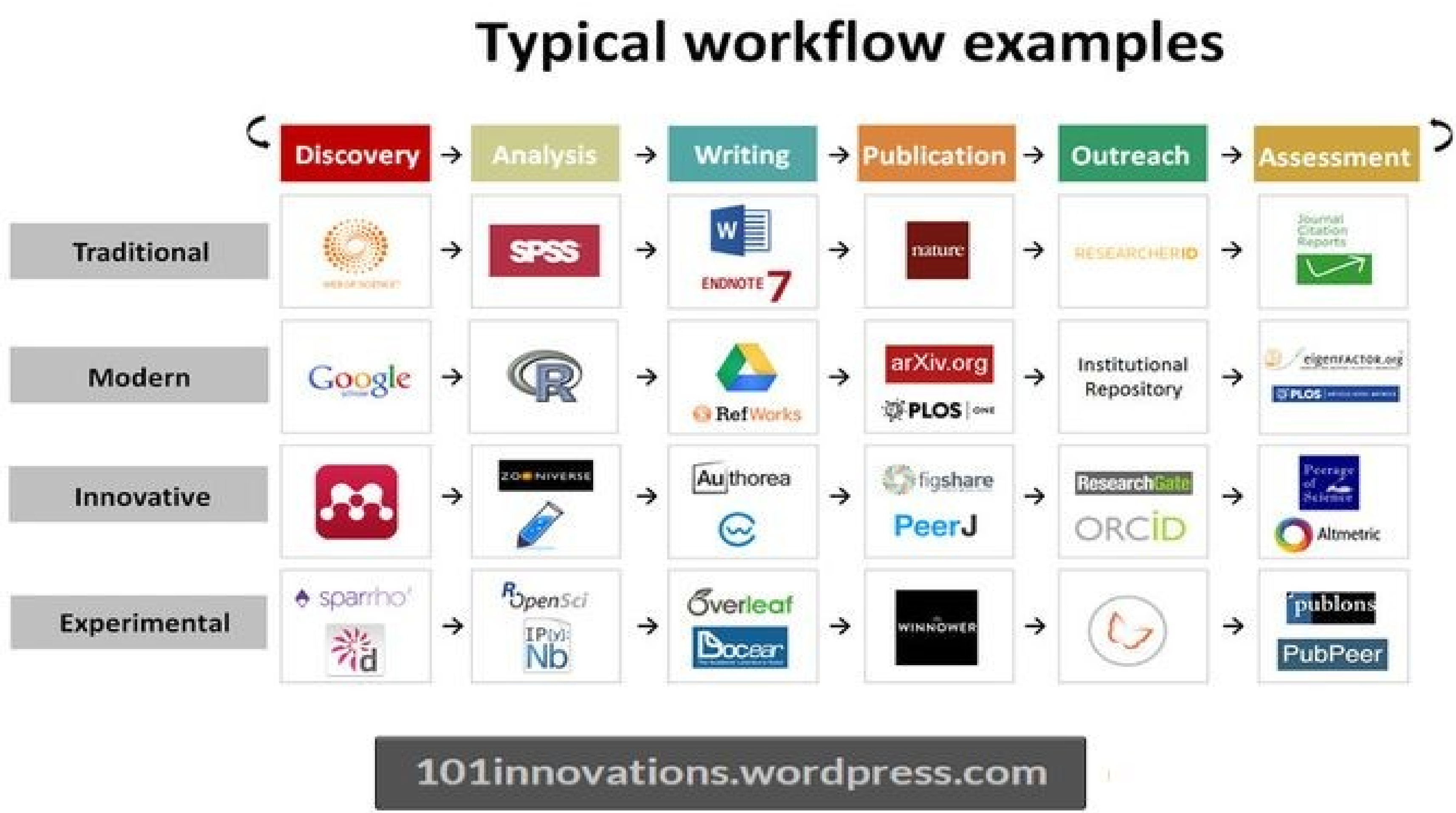
The number of journals will be reduced

# Notre politique éditoriale

*Très similaire à celle de PLOSONE*

- Rejet absolu de l'impact factor (afin de contrer la dérive actuelle)
  - Qualité d'un article jugée à son nombre de citations
    - Accélérer la publication scientifique

# Notre système est en pleine mutation
## et il ne faudra pas « rater le train »



# Challenges

- D'inciter les chercheurs à publier selon le paradigme du « toujours mieux » et non plus selon celui du « toujours plus »

- De ne plus baser l'évaluation des chercheurs, des projets et des laboratoires sur les IF des revues dans lesquels ils publient

*L'intérêt de la Science est ailleurs, et il faut être conscient que les dérives actuelles de ce système nuisent à l'avancée des connaissances scientifiques.*

# http://open.u-bordeaux.fr/journals/

université de BORDEAUX

About | Login | Search

## Scholarly journals portal

Home > **Scholarly journals portal**

### OENO One

OENO One publishes original research reports, short research notes and review papers in the fields of viticulture, grapevine physiology and genetics, oenological sciences, winemaking technology, microbiology, sensory sciences, winechemistry.

View Journal | Current Issue | Register

### Journal of Plant Hydraulics

JPH publishes manuscripts that address relevant questions on plant hydraulics, plant and ecosystem water relations and the physiology and genetic of drought resistance. We are happy to publish all papers that are judged to be technically sound. Reviews are thus applied for readability, clarity, technical correctness, and appropriate scope and interpretation. The journal is free of any charge and is indexed by Google Scholar.

View Journal | Current Issue | Register

### Journal d'Actualité des droits européens

JADE is an online legal journal gathering short comments on legal and judicial news related to the European Union and the Council of Europe. It also has a newsletter (subscription free of charge) sent twice a month

View Journal | Current Issue | Register

### Contacts

Direction de la documentation
doc-journals@u-bordeaux.fr

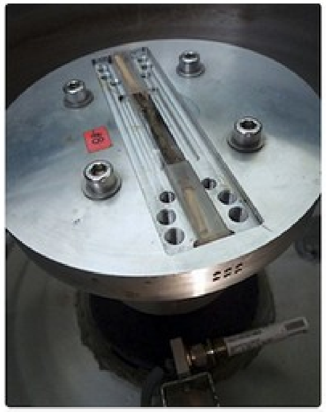
### Partners

Programme financé par l'ANR ANR No.–10-IDEX-03-02

BORDEAUX SCIENCES AGRO

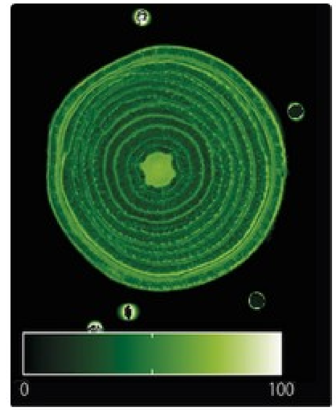
### Journal Help

## Most recent Articles



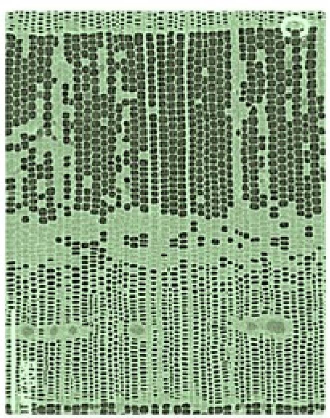
**Improved precision of hydraulic conductance measurements using a Cochard rotor in two different centrifuges**

Yujie Wang, et al.



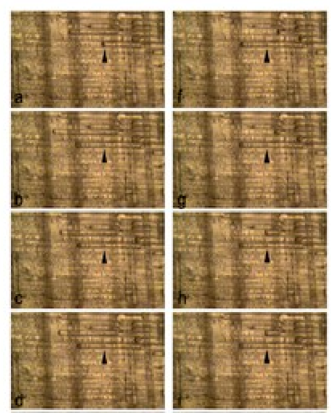

**Visualization of the stem water content of two genera with secondary phloem produced by successive cambia through Magnetic Resonance Imaging (MRI)**

Elisabeth M. R. Robert, et al.



**Dynamics of cavitation in a Douglas-fir tree-ring: transition-wood, the lord of the ring?**

Guillermina Dalla-Salda, et al.



**Evidence for Air-Seeding: Watching the Formation of Embolism in Conifer Xylem**

Stefan Mayr, et al.

SEARCH

SUBMIT YOUR RESEARCH

Notifications

Sign up for news and updates

Share

@JPlantHydro Tweets

Tweets by @JPlantHydro

J. Plant Hydraulics Retweeted

Hervé Cochard @HCochard

"I would like to see many more very low-cost journals being set up by academics in the control of academics rather than publishers" Gowers

05 Mar

J. Plant Hyd... @JPlantHydro

Our OJS platform is now open for manuscript submission.
Register and submit your best research on plant hydraulics!
jplanthydro.org/author/submit

02 Mar

J. Plant Hyd... @JPlantHydro

Embed View on Twitter

http://jplanthydro.org

*Journal of Plant Hydraulics*

LOGIN | REGISTER | ADVANCED SEARCH | PORTAL HOME

Articles ▾ About ▾ For authors ▾ Resources ▾ Contact

Home › 2014 › Dalla-Salda

SEARCH

Download article ▾

# Dynamics of cavitation in a Douglas-fir tree-ring: transition-wood, the lord of the ring?

Guillermina Dalla-Salda, María Elena Fernández, Anne-Sophie Sergent, Philippe Rozenberg, Eric Badel, Alejandro Martinez-Meier

**Received** : 8 February 2016; **Revised** : 14 March 2016; **Accepted** : 8 February 2016; **Published** : 26 November 2014

ARTICLE | AUTHOR INFO | SUPPORTING INFORMATION | METRICS

## Abstract

The objective of this work was to investigate the dynamics of embolism formation within a Douglas-fir tree-ring. Four resistant and four vulnerable 10-year-old trees were selected among 50 trees, based on their $P_{50}$. Stem samples, taken next to those used to obtain the vulnerability to cavitation curves, were collected and submitted to increasing positive pressures, in order to simulate increasing tension caused by water stress in the xylem. Then the conductive surface of the samples was stained and scanned and the images were analyzed. X-ray microdensity profiles were obtained on the same samples. The microdensity profiles of the 2011 ring were analyzed in three parts, earlywood, transition-wood and latewood. The dynamics of embolism propagation was observed separately in these three parts. Our results showed that the initiation and the propagation of the cavitation follow a discrete trend, with at least two successive initiation events: first cavitation initiates and propagates rapidly in the latewood. Then, a second cavitation event begins and spreads in the earlywood and eventually propagates to the transition-wood, which remains the last conductive part in the ring before full embolism. We observed that resistant to cavitation trees showed lower transition-wood density than vulnerable to cavitation trees.



## Introduction

Water transport in trees can be limited by cavitation. Cavitation is the breaking of the water column that follows atmospheric demand and transpiration increase and/or soil water content decrease, particularly in drought conditions. Cavitation initiates in the cells of the conductive xylem (tracheids in conifers) when the cell water copes with increasing tensions (Hacke and Sperry 2001) and turns from a liquid metastable state to a more stable gaseous state (Cruiziat et al. 2002, Tyree and Zimmerman 2002, Mayr et al. 2014). According to the air-seeding hypothesis, cavitation propagates from cell to cell as air is aspirated from a non-functional air-filled tracheid into a conductive one through the inter-tracheid pits (Delzon et al. 2010). Little information is available about where exactly cavitation springs up in a tree-ring and how it propagates inside it. Domec and Gartner (2002) have studied vulnerability to cavitation of earlywood and latewood in Douglas-fir (*Pseudotsuga menziesii* (Mirb) Franco) finding that latewood was more vulnerable to cavitation at high trunk water potentials than earlywood. This suggests that cavitation could start in latewood, and then spreads to earlywood. The dynamics of cavitation initiation and propagation within the growth ring may have important functional implications since if water is released from cavitated latewood this could decrease earlywood tension (capacitance function, Meinzer et al. 2009) leading to ks maintenance during drought. However, if cavitation initiates on the largest tracheids of earlywood, this may result in a strong and early decrease in ks.

Earlywood is produced in temperate climate during the first part of the growing season. In conifers, earlywood is formed of large-lumen, narrow-wall low-density tracheids. Latewood is produced later during the growing season, generally when atmospheric demand increases, soil water content depletes and photoperiod decreases. Latewood is formed of narrower-lumen, thicker-wall denser tracheids. The transition from earlywood to latewood is more or less gradual according to the species (Ivkovich and Rozenberg 2004) and the cambial age (Zobel and Sprague 1998). Conventionally, tree-rings are cut into earlywood and latewood. This action arbitrarily splits the transition zone and mixes it with earlywood and latewood. Some authors have suggested that it may be useful to separate the transition zone from earlywood and latewood, cutting the ring into three parts (Rozenberg et al. 2004, Franceschini et al. 2013), thus defining more homogeneous earlywood and latewood. As a matter of fact, Dalla-Salda et al. (2011) found a stronger relationship between wood density and resistance to cavitation when they used the homogeneous first part of the earlywood rather than the conventionally-defined heterogeneous earlywood.

Changes in ring structure may result in changes in the hydraulic architecture of plants with direct consequences on water supply to the leaves and tree growth and/or survival (Froux et al. 2002, De Micco et al. 2008, Martinez-Meier et al. 2008, Hoffmann et al. 2011). Tree-ring structure can be thoroughly described using X-ray microdensity profiles (Polge 1966). Wood microdensity is determined by cell dimension: it describes the proportion of cell wall in a given woody tissue. This proportion reflects wood mechanical and functional properties (Zobel and van Buijtenen 1989, Hacke and Sperry 2001, Hacke et al. 2001) that are related with the three wood functions: the mechanical support of the body of the plant (Zobel and Sprague 1998), the storage of water and biological chemicals (Stratton et al. 2000) and the safe and efficient transport of water from the roots to the leaves (Maherali et al. 2004, Pitterman et al. 2006,). Determinist relationship between wood density and vulnerability to cavitation is unclear. Several studies found positive correlations (Hacke and Sperry 2001, Rosner et al. 2007, Dalla-Salda et al. 2009, 2011), while others reported a lack of relationship (Lamy et al. 2012).

The present study had three objectives: 1) to investigate the dynamics of embolism formation within the tree-ring of Douglas-Fir; 2) to compare the dynamics of tracheids embolism within the tree-ring between resistant and vulnerable trees; and 3) to determine whether the variation found between resistant and vulnerable trees (if any) in terms of dynamic of embolism formation could be related with the microdensity structure of the ring. Initiation and propagation of embolism in the ring were studied for homogeneously-defined earlywood, latewood and a separate transitional zone by means of analyses of images of stained wood surface and X-ray microtomography of wood samples taken at variable embolism levels from exposure to different pressure intensities. X-ray microtomography appears now as a reference technique for embolism visualization in xylem (Cochard et al. 2014), but as it's, a time-consuming method, only one resistant to cavitation tree was analyzed. We applied the staining method analysis to eight Douglas-fir trees selected for their differential resistance to cavitation: the four more resistant and the four more vulnerable among a set of fifty trees. Microdensity profiles of wood samples of the same 8 trees were studied with x-ray methodology (Polge 1966). To our knowledge, there is no study documenting the intra-ring dynamic of embolism formation in relation with microdensity.

## Materials and methods

### Plant Material

The studied plants were 11 years old Douglas-firs from a genetic trial belonging to INTA (Instituto Nacional de Tecnología Agropecuaria, Argentina) near Trevelin, Patagonia - Argentina (43° 06' S - 71° 32' W).

Firstly, stem vulnerability to cavitation (VC) curves were obtained with the air injection method (Cochard et al. 1992) on 50 trees from 10 different genetic entities. In order to characterize the trees for their resistance to cavitation,

**Article Tools**

Print this article
How to cite item
Email this article (Login required)
Email the author (Login required)
Post a Comment (Login required)

**Share**

@JPlantHydro Tweets

Tweets by @JPlantHydro

J. Plant Hydraulics Retweeted
**Hervé Cochard** @HCochard
"I would like to see many more very low-cost journals being set up by academics in the control of academics rather than publishers" Gowers
05 Mar

**J. Plant Hydraulics** @JPlantHydro
Our OJS platform is now open for manuscript submission.
Register and submit your best research on plant hydraulics!
jplanthydro.org/author/submit
02 Mar

**J. Plant Hydraulics** @JPlantHydro
We are working hard on our new web site. Looks already great !
Keep posted!

Thanks Hélène, Christophe et al.

Embed | View on Twitter

# Remerciements

Université de BORDEAUX

INRA SCIENCE & IMPACT

Excellence Initiative of Université de BORDEAUX

A leading international research university, with strong regional connections


- Hélène Coussy-Lacroix et Karen Raynal (DSI)
- Antoine Blanchard (Idex)
- Francois Pellegrini (UB)