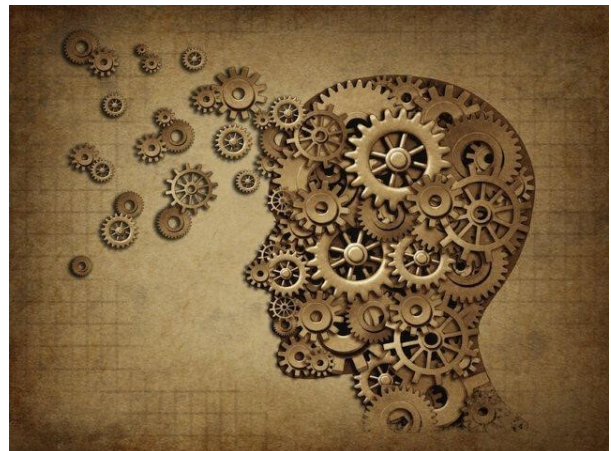




Grading evidence of mechanisms in physics and biology



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Science is largely involved with discovering mechanisms. While protocols have been developed in evidence-based medicine for grading evidence of correlations as a means to establish causal claims in medicine and public health, much less has been said about how to grade evidence of mechanisms on the path to mechanism discovery in science – this task is typically left to the intuition of individual researchers. With the advent of ‘big data’ and ‘systems’ science, eyeballing the evidence and appealing to intuition is becoming less of an option: more explicit methods are needed. This project will focus on mechanism discovery in physics and biology and will ask:




- What are the various kinds of evidence of mechanisms in physics and biology?
- How does evidence of mechanisms in physics relate to that in biology?
- How can case studies of mechanism discovery be used to shed light on the way in which different kinds of evidence of mechanisms should be graded?
- How can philosophical work on evidence shed light on how scientific evidence of mechanisms should be graded?
- Can one develop simple protocols for grading evidence of mechanisms, analogous to the GRADE system of evidence-based medicine?
- Is there more to grading scientific evidence of mechanisms than can be gleaned from philosophical theories of evidence?
- Which philosophical theories of evidence best fit the use of mechanistic evidence in science?


Veli-Pekka Parkkinen, Christian Wallmann, Michael Wilde, Brendan Clarke, Phyllis Illari, Michael P. Kelly, Charles Norell, Federica Russo, Beth Shaw and Jon Williamson: **Evaluating evidence of mechanisms in medicine: Principles and procedures**, Springer, 2018.  

Jeffrey K. Aronson, Adam La Caze, Michael P. Kelly, Veli-Pekka Parkkinen and Jon Williamson: **The use of mechanistic evidence in drug approval**, *Journal of Evaluation in Clinical Practice*.   doi: 10.1111/jep.12960

Stefan Dragulinescu: **Medical Mechanisms and the Resilience of Probabilities**, *Episteme*, <https://doi.org/10.1017/epi.2018.12>


Stefan Dragulinescu: **On the compatibility between Bayesianism and inference to the best explanation**, under review.

Jon Williamson: **Establishing causal claims in medicine**, *International Studies in the Philosophy of Science*, in press. 

Veli-Pekka Parkkinen & Jon Williamson: **Extrapolating from model organisms in pharmacology**, in La Caze, A., & Osimani, B., (eds), *Uncertainty in pharmacology: epistemology, methods, and decisions*, Springer, in press. 

Veli-Pekka Parkkinen: **Are animal models theoretical models?**, *Disputatio*, in press.

Jon Williamson: **Models in systems medicine**, *Disputatio*, in press. 

Veli-Pekka Parkkinen & Michael Wilde: **Extrapolation and the Russo-Williamson thesis**, *Synthese*, 2017. 

Veli-Pekka Parkkinen: **Experiment, downward causation and interventionist levels of explanation**. *International Studies in the Philosophy of Science* 30:245-261, 2017.  DOI: 10.1080/02698595.2017.1316116

Veli-Pekka Parkkinen, Federica Russo & Christian Wallmann: **Scientific Disagreement and Evidential**

4-5 September 2017: **Grading evidence of Mechanisms**, University of Kent.

15 May 2017: **Inferring Policy from Experiments**, Cornwallis Octagon Lecture Theatre 3, University of Kent. Conference report on the EBM+ Blog. Conference report in *The Reasoner*.

10.30 – 11.50 **Nancy Cartwright** – Two xApproaches to EBHP: Intervention-centring, Context-centring. [Slides](#). [Audio](#).

13.15 – 14.35 **Sarah Wieten** – What good are pragmatic trials? [Slides](#). [Audio](#).

14.45 – 16.05 **Mike Kelly** – Inferring policy from evidence? The case of non-communicable disease and health inequalities in the UK. [Slides](#). [Audio](#).

Workshop: Explanation and evidence of mechanisms across the sciences, University of Kent, 16 May 2016.

9.00-10.00 Jürgen Landes – ‘Role of mechanisms in causal inference in pharmacology’

10.15-11.15 Gry Oftedal – ‘Intervention and explanation in research on targeted cancer treatment’

11.15-12.15 Julian Reiss – ‘Evidential reasoning about a target without extrapolation?’

13.45-14.45 Beate Krickel – ‘Against activities’

14.45-15.45 Phyllis Illari & Brendan Clarke – ‘Heuristics and inference methods’

16.00-17.00 Jaakko Kuorikoski – ‘Weighing Evidence: A Mechanism-Based Approach’

Workshop: Processes, University of Kent, 12 May 2016


9.15-11.00 John Dupre (Exeter) – ‘Process, Organisms, and Kinds.’


11.15-13.00 Johanna Seibt (Aarhus) – ‘What is (a) process?’


14.00-15.45 Thomas Crowther (Warwick) – ‘An Ontology of Processes’


16.00-17.45 James Williams (Deakin) – ‘Dangerous illusions of autonomy: a process critique of the concept of autopoiesis’


Pluralism: Lessons from the Studies on


Hypercholesterolemia, *Humana.Mente Journal of Philosophical Studies* 32 75–116, 2017. 


Stefan Dragulinescu: **Inference to the best explanation as a theory for the quality of mechanistic evidence in medicine**, *European Journal for Philosophy of Science* 7:353-372, 2016.  doi [10.1007/s13194-016-0165-x](https://doi.org/10.1007/s13194-016-0165-x)


Veli-Pekka Parkkinen: **Robustness and evidence of mechanisms in early experimental atherosclerosis research**, *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 60:44-55, 2016.  doi [10.1016/j.shpsc.2016.09.006](https://doi.org/10.1016/j.shpsc.2016.09.006)


Stefan Dragulinescu: **Inference to the best explanation and mechanisms in medicine**, *Theoretical Medicine and Bioethics* 37:211–232, 2016. 


Stefan Dragulinescu: **Mechanisms and difference making**, *Acta Analytica* 32:29-54, 2017.  DOI [10.1007/s12136-016-0292-1](https://doi.org/10.1007/s12136-016-0292-1)

Michael Wilde & Jon Williamson: **Models in medicine**, in H. Kincaid, J. Simon & M. Solomon (eds), *The Routledge Companion to Philosophy of Medicine*. Routledge, pp. 271-284, 2016.  ISBN: 978-1-13-884679-1

Michael Wilde & Jon Williamson: **Evidence and Epistemic Causality**, in A. von Eye & W. Wiedermann (eds), *Statistics and Causality: methods for applied empirical research*. Wiley, pp. 31-41, 2016.  ISBN: 978-1-118-94704-3

Michael Wilde & Jon Williamson: **Models in medicine**, in H. Kincaid, J. Simon & M. Solomon (eds), *The Routledge Companion to Philosophy of Medicine*. Routledge, pp. 271-284, 2016.  ISBN: 978-1-13-884679-1

Anders Strand & Veli-Pekka Parkkinen: **Causation in evidence-based medicine: in reply to Kerry et al.**, *Journal of Evaluation in Clinical Practice* 21(3):532-534, 2015. 

Jon Williamson: **Deliberation, Judgement and the Nature of Evidence**, *Economics and Philosophy* 31(1): 27-65, 2015.  doi: [10.1017/S026626711400039X](https://doi.org/10.1017/S026626711400039X)



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