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Name1 Surname[1,2☯], Name2 Surname[2☯], Name3 Surname[2,3¤], Name4 Surname[2], Name5 Surname[2‡], Name6 Surname[2‡], Name7 Surname[1,2,3*], with the Lorem Ipsum Consortium[¶]

1 Affiliation Dept/Program/Center, Institution Name, City, State, Country
2 Affiliation Dept/Program/Center, Institution Name, City, State, Country
3 Affiliation Dept/Program/Center, Institution Name, City, State, Country

☯These authors contributed equally to this work.
‡These authors also contributed equally to this work.
¤Current Address: Dept/Program/Center, Institution Name, City, State, Country
†Deceased
¶Membership list can be found in the Acknowledgments section.
* correspondingauthor@institute.edu

Abstract

Text

Author summary

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Introduction

Connectivity in brain networks is not uniformly distributed. Network elements with high node degree – i.e., a large number of connections to other areas – are called 'hubs'. When hubs are more densely interconnected than expected by chance they form a 'rich-club', the idea being that the richest members of the network (in terms of connections) are tightly connected to each other, thus forming a club. These densely interconnected hubs are thought to promote efficient integration between anatomically distinct areas and play an important role in brain functioning. It has been shown that hubs exhibit distinct transcriptional signatures in both humans [**?**] and mice [**?**]. According to Fulcher Fornito [2], connections involving rich club hubs carry a distinctive genetic signature, which is driven by genes regulating the synthesis and breakdown of adenosine triphosphate (ATP) – the primary energetic substrate of neuronal signaling [2]. These findings highlight a close relationship between metabolic expenditure and the high signaling load of hub regions in the brain, as has been previously proposed [3]. We therefore have some preliminary indications that the transcriptional signature of hubs may be a consistent feature of mammalian brain networks, but it is not known how distinctive this expression signature is; and in particular, whether it holds true for networks resolved at the scale of individual neurons and synapses. To test this possibility, we aimed to replicate findings presented in [2] using microscale connectivity data in C. elegans and gene expression data from WormBase. We sought to determine whether hubs in the C. elegans connectome exhibit

distinct gene expression patterns. Lorem ipsum dolor sit [1] amet, consectetur adipiscing elit. Curabitur eget porta erat. Morbi consectetur est vel gravida pretium. Suspendisse ut dui eu ante cursus gravida non sed sem. Nullam Eq (1) sapien tellus, commodo id velit id, eleifend volutpat quam. Phasellus mauris velit, dapibus finibus elementum vel, pulvinar non tellus. Nunc pellentesque pretium diam, quis maximus dolor faucibus id. [2] Nunc convallis sodales ante, ut ullamcorper est egestas vitae. Nam sit amet enim ultrices, ultrices elit pulvinar, volutpat risus.

$$\mathrm{P_Y} = \underbrace{H(Y_n) - H(Y_n|\mathbf{V}_n^Y)}_{S_Y} + \underbrace{H(Y_n|\mathbf{V}_n^Y) - H(Y_n|\mathbf{V}_n^{X,Y})}_{T_{X\to Y}}, \quad (1)$$

Materials and methods

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Results

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Discussion

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Conclusion

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Supporting information

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References

1. Conant GC, Wolfe KH. Turning a hobby into a job: how duplicated genes find new functions. Nat Rev Genet. 2008 Dec;9(12):938–950.
2. Ohno S. Evolution by gene duplication. London: George Alien & Unwin Ltd. Berlin, Heidelberg and New York: Springer-Verlag.; 1970.
3. Magwire MM, Bayer F, Webster CL, Cao C, Jiggins FM. Successive increases in the resistance of Drosophila to viral infection through a transposon insertion followed by a Duplication. PLoS Genet. 2011 Oct;7(10):e1002337.