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Letter

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Schmidt (2020) described three cases of tracer injection in a puffer fish. One, which he claims to be a nucleus corticalis injection and two cases of tectal injections. These three cases are part of a larger set of tracer injections in the puffer fish that are all contained in two slide boxes. All injections were made by a member of my lab. Mr. Schmidt was not involved in the production of these cases. He only took photographs and used them without authorization. The original sections are still in my slide collection.

In his paper, Schmidt selected two cases of tectum injection although there are eight tectal cases in total available. There are no cases of injections into the nucleus corticalis, the case Mr. Schmidt claims to be a nucleus corticalis injection is an injection into the rostro-dorsol tegmentum. The selection of only three cases and mislabeling one is bad enough. But he also reports only on labeled nucleus corticalis cells and their processes, and conceals a large number of other structures that are also labeled in the three cases. Considering all structures labeled, his conclusion would not be justified.

I will describe the three cases used by Mr. Schmidt in more detail and then mention some other cases that are very relevant and were available to Mr. Schmidt, but were neglected by him.

Alleged “nucleus corticalis injection”

The “nucleus corticalis” case was used to show that the dendrites of the cells are extending into two distinct layers in the tectum. This conclusion would be true, if the injection was indeed limited to the nucleus corticalis and that there are no other cells labeled in this case. Both is wrong. Fig. 1 shows the case that Mr. Schmidt was photographed for the paper. Fig. 1A shows the injection site. It is located in the rostro-caudal tegmentum. The arrows point to the track the injection pipette was making. The nucleus corticalis cells were probably labeled by their axons passing through the injection site on their way to the nucleus glomerulosus. Afferents to the tectum arise from many cells around the injection site. In addition, many other cell bodies were labeled throughout the brain that have axons passing through the injection site. Many of them are known to project to the tectum. Thus, fibers seen in the tectum can be of any origin and do not have to be dendrites of corticalis cells as Schmidt suggests. By concealing all other afferents, Mr. Schmidt deceives the reader about the real extend of the case and is even lying about the true injection site.

Tectal injections

In both cases, Mr. Schmidt reported only labeled cells in the nucleus corticalis and claimed that the fibers in the tectum are their dendrites. It is very unlikely that tectal injections result in only labeled corticalis cells. The tectum receives input from many sources and this is also the case in the material Mr. Schmidt was using. Fig. 2 shows cell bodies labeled in Schmidt’s first case and Fig. 3 labeled cells in Schmidt’s second tectal case. In both cases, there are also labeled fibers in the optic nerve (not shown). Even without further evidence, it is impossible that a tectal injection labels only the dendrites of corticalis cells. A superficial injection would label predominantly superficial fibers and a deeper injection label deeper fibers even if there would be no corticalis cells. Given all the other inputs to the tectum shown in Figs. 2 and 3, it is impossible to conclude that the fiber in the tectum are dendrites of corticalis cells.

The conclusion of Mr. Schmidt that the different projection pattern in the nucleus glomerulosus is due to the depth of the injection into the tectum is also not justified. One injection is very dorsal and the second one is extreme lateral. It may be simply a topography that causes the different projection pattern. No way to tell from just two tectal cases. But the most serious issue here is that Mr. Schmidt talks only about corticalis cells and conceals all other labeled structures to prove his point.

Other injections

There are other injections that were in the same boxes. Apart from the six other tectal cases that were ignored by Mr. Schmidt, there are other injections into the nucleus glomerulosus, corpus

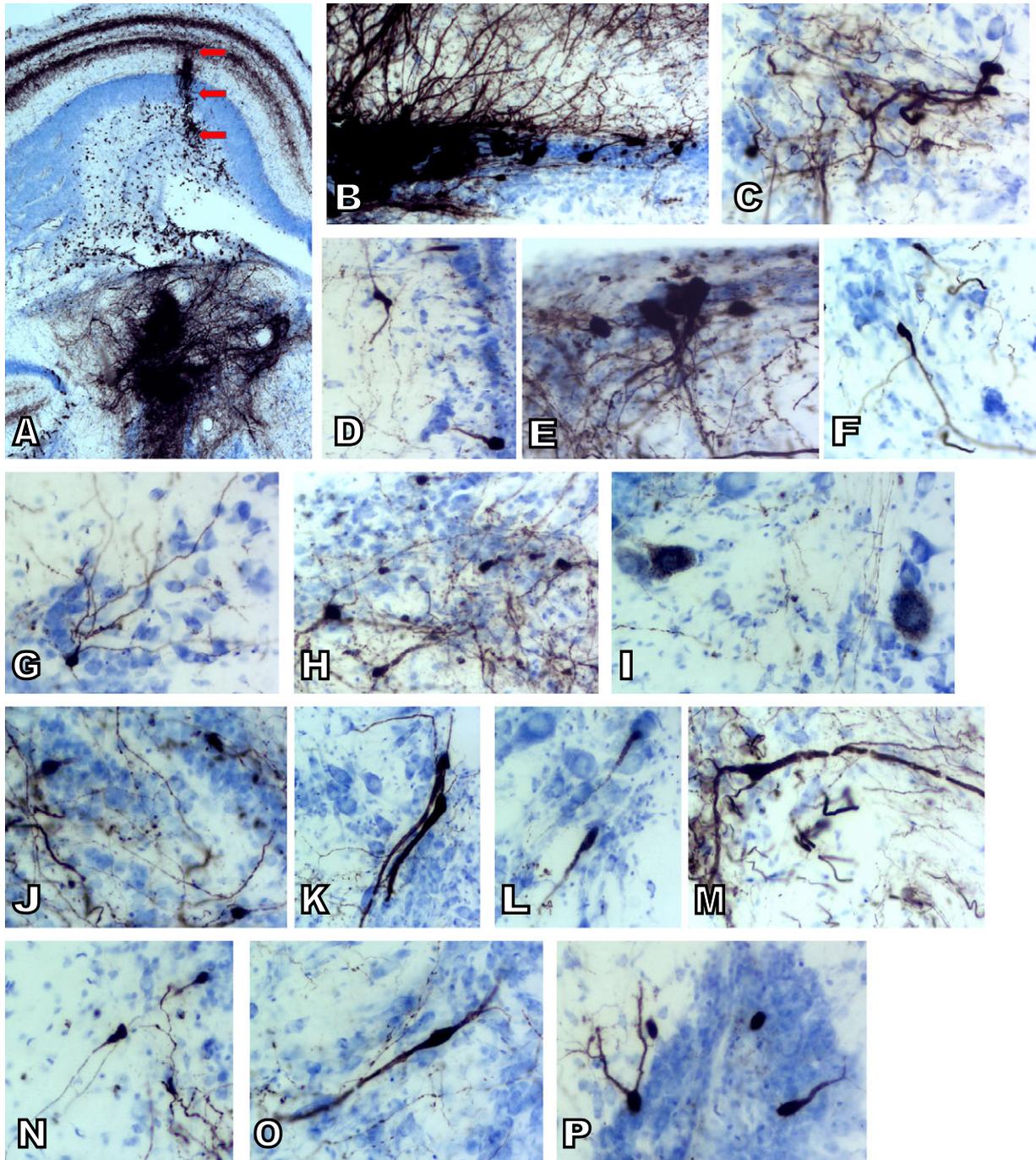


Fig. 1. Photographs of labeled cells in the 'nucleus corticalis' case of Mr. Schmidt. The true injection site is shown in A, the electrode track is partly visible in the tectum. (B) Labeled cells in the nucleus corticalis (corresponds to fig. 1C of Schmidt, 2020). (C) pretectal area. (D) anterior thalamus, (E) Edinger Westphal nucleus, (F) rostral reticular formation, (G) inferior lobe, (H) torus semicircularis, (I) inferior lobe, (J) nucleus lateralis valvulae, (K) medial reticular formation, (L) caudal reticular formation, (M) caudal tegmentum, (N) medial torus semicircularis, (O) medial reticular formation, and (P) periventricular hypothalamus.

mammillare, inferior lobes, and so on that are partly contradictory to the hypothesis of Mr. Schmidt. All those cases were available to Mr. Schmidt, but were ignored. Instead, he was choosing only three cases that fit his idea.

Conclusion

Mr. Schmidt has selected only three cases from many relevant injections and has not even adequately described those. He

concealed most of the labeled structures and showed only those that he thinks the reader should see. This is an extreme case of cherry-picking in combination with lying about the location of an injection site.

Scientific publications are only valuable if they report true facts and present all data that are available. In case of anatomical data, it is not always possible to make the sections available in a digitized form. In this case, it is very important to present drawings or photographs that show all labeled

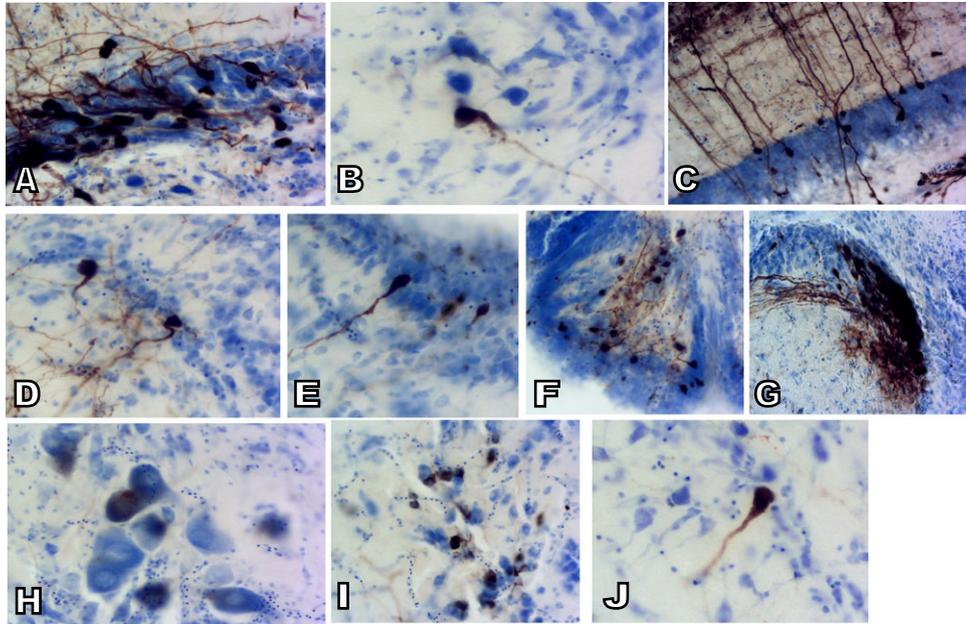


Fig. 2. Photographs of labeled cell bodies in the first tectal case of Schmidt. (A) Labeled cells in the nucleus corticalus corresponding to fig. 1G of Schmidt (2020). (B) Labeled cells in the caudal tegmentum, (C) tectum, far from injection site, (D) deep torus semicircularis, (E) superficial torus semicircularis, (F) torus longitudinalis, (G) nuclues isthmi, (H) inferior lobe, (I) corpus mammilaris, and (J) reticular formation.

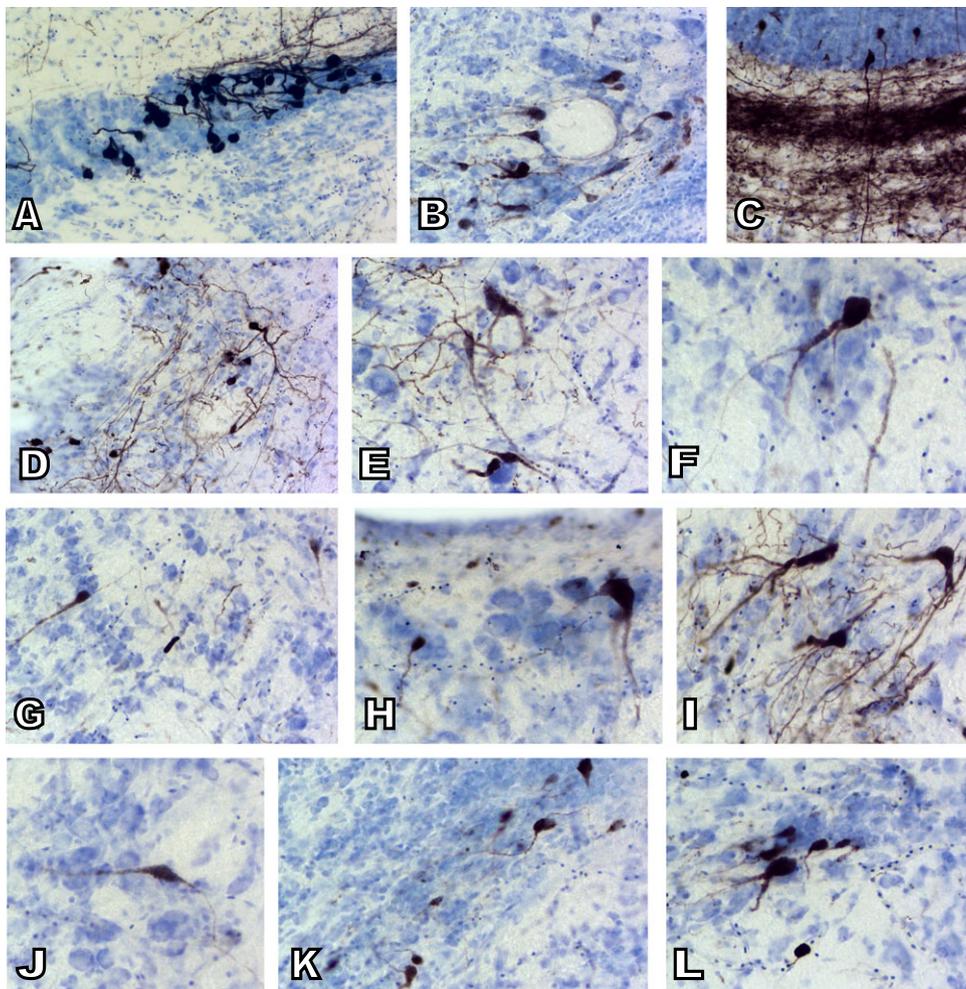


Fig. 3. Photographs of labeled cell bodies in the second tectal case of Schmidt. (A) Labeled cells in the nucleus corticalus corresponding to fig. 1K of Schmidt (2020). (B) Labeled cells in the nucleus of the posterior commissure, (C) tectum, far from injection site, (D) rostral torus semicircularis, (E) rostral tegmentum, (F) dorsal tegmentum, (G) medial torus semicircularis, (H) Edinger Wesphal nucleus, (I) caudal tegmentum, (J) reticular formation, (K) posterior thalamus, and (L) anterior thalamus.

structures. The interpretation of the data is then made in the discussion and the reader can decide whether he agrees with the conclusions or not. However, if the reader is only presented with just the labeled structures that author finds relevant, the results section would be worthless. And, if the reader cannot even trust that an injection site is reported correctly, the paper should be removed from the scientific literature

because it harms more than it helps and is a case of scientific misconduct.

Reference

Schmidt, M. (2020). Two different areas of the nucleus glomerulosus in the South American pufferfish, *Colomesus asellus*. *Visual Neuroscience* 37, E003 doi:10.1017/S0952523820000012.