# Article information:

Proximal tubules eliminate endocytosed gold nanoparticles through an organelle-extrusion-mediated self-renewal mechanism | Nature Nanotechnology
<https://www.nature.com/articles/s41565-023-01366-7>

# Article summary:

1. Renal clearance is often viewed as a passive process, but filtered nanoparticles can actively interact with renal tubules, particularly proximal tubules (PTs), which play a central role in the active uptake, reabsorption and metabolism of filtered substances.

2. Endocytosed nanoparticles are eliminated by PTECs through an organelle-extrusion-mediated self-renewal mechanism, involving endocytosis, biotransformation in the endosomes/lysosomes and cellular elimination through organelle extrusion on the luminal membrane of PTs.

3. PTECs directly eject entire gold-containing lysosomes/endosomes along with other organelles into the proximal tubular lumen to form extruded vesicles, representing a nanoparticle-elimination mechanism distinct from those membrane-fusion-mediated.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

作为一篇科学研究论文，该文章在描述了肾脏对纳米颗粒的清除机制方面提供了有价值的信息。然而，文章存在一些潜在的偏见和局限性。

首先，文章可能存在对肾脏清除机制的过度简化。虽然文章提到了肾小管对纳米颗粒的主动吸收和代谢作用，但它没有考虑其他可能影响纳米颗粒清除的因素，如肾小球滤过率、血液流动性等。此外，文章也没有探讨不同类型和大小的纳米颗粒在肾脏中的行为差异。

其次，文章可能存在对实验结果的片面报道。尽管作者声称发现了PTECs消除内吞2-3nm金纳米颗粒及其200-300nm大型聚集体的机制，并提供了相关证据支持这一结论，但他们并没有探讨其他可能解释这些结果的因素或机制。

此外，在描述PTECs消除内吞纳米颗粒的机制时，作者使用了“自我更新”这个词汇来形容细胞通过器官外推出物质来消除内吞物质。然而，“自我更新”这个术语并不常用于描述生物学过程，可能会引起读者的困惑。

最后，文章没有探讨纳米颗粒对人体健康的潜在风险。虽然文章提到了减少纳米颗粒在体内积累的重要性，但它没有考虑这些颗粒可能对人体产生的毒性或其他不良影响。此外，文章也没有探讨如何减少纳米颗粒进入环境和人类体内的方法。

总之，该文章提供了有价值的信息，但存在一些局限性和未解决的问题。为了更全面地理解肾脏清除机制以及纳米颗粒对人类健康的影响，需要进行更多研究和探索。

# Topics for further research:

* Other factors affecting nanoparticle clearance in the kidneys
* Differences in behavior of different types and sizes of nanoparticles in the kidneys
* Other possible explanations for experimental results
* Clarification of the term self-renewal in describing cellular processes
* Potential health risks of nanoparticles
* Methods for reducing nanoparticle accumulation in the environment and human body

# Report location:

<https://www.fullpicture.app/item/ddcf03dcf708602ed37ca9a770cb2951>