# Article information:

Bioinspired Copper Single‐Atom Catalysts for Tumor Parallel Catalytic Therapy - Lu - 2020 - Advanced Materials - Wiley Online Library
<https://onlinelibrary.wiley.com/doi/10.1002/adma.202002246>

# Article summary:

1. Nanocatalytic medicine for tumor therapy: The article discusses the use of nanocatalytic medicine for tumor therapy, which involves initiating intratumoral catalytic chemical reactions to generate toxic species from non-/less toxic substances. This approach enables tumor-specific therapy with minimal side effects on normal tissues/organs.

2. Generation of reactive oxygen species (ROS) for tumor suppression: The article highlights the importance of generating intra-tumoral reactive oxygen species (ROS) to induce malignant tumor cell apoptosis or necrosis. Various strategies such as photodynamic therapy (PDT), sonodynamic therapy (SDT), radiotherapy (RT), and chemodynamic therapy (CDT) have been developed to produce ROS for tumor suppression. However, limitations such as hypoxic environments and low H2O2 levels in tumors have prompted the need for enhanced ROS generation.

3. Bioinspired copper single-atom catalysts: Inspired by multi-copper oxidases in nature, the article describes the synthesis of a bioinspired copper single-atom catalyst that can directly catalyze the concurrent generation of two types of ROS from both oxygen and hydrogen peroxide via parallel reactions. This catalyst shows high therapeutic efficacy, relatively low metal concentrations, and negligible side effects, making it a promising candidate for nanocatalytic medicine in tumor therapy.

# Article rating:

Appears strongly imbalanced: The article is written in a biased or one-sided way, and the information it provides is not trustworthy enough to be considered a reliable source. You should consult other sources to find reliable information on the presented issues.

# Article analysis:

对于上述文章的批判性分析，以下是一些潜在的偏见和问题：

1. 片面报道：文章主要关注了铜单原子催化剂在肿瘤治疗中的应用，但没有提及其他可能存在的治疗方法或催化剂。这种片面报道可能导致读者对该方法的过度乐观或忽视其他潜在的治疗选择。

2. 缺失的考虑点：文章没有讨论铜单原子催化剂在体内使用时可能产生的毒性或副作用。虽然作者提到了铜摄入量低于阈值时是无毒的，但并未详细探讨高剂量下可能出现的风险。

3. 无根据的主张：文章声称多氧酸盐类催化剂可以直接通过多个含氧反应物进行并行催化反应来产生多种活性氧物种。然而，文章没有提供足够的证据来支持这一主张，并且未引用相关研究结果。

4. 缺失证据：尽管文章提到了铜单原子催化剂在有机氧化反应中具有高催化活性，但并未提供实验证据来支持其在肿瘤治疗中诱导细胞凋亡和/或坏死的能力。

5. 未探索的反驳：文章没有探讨其他学者对铜单原子催化剂在肿瘤治疗中的应用的质疑或反驳观点。这种选择性地忽视反对意见可能导致读者对该方法的误解或过度乐观。

6. 宣传内容：文章中存在一些宣传性语言，如将铜单原子催化剂描述为“显著提高肿瘤治疗效果”的方法。这种宣传性语言可能会误导读者，并使他们对该方法的效果产生不切实际的期望。

综上所述，上述文章存在一些潜在的偏见和问题，包括片面报道、无根据的主张、缺失证据和未探索的反驳。批判性分析有助于识别这些问题，并促使读者更加全面地评估所提出的主张。

# Topics for further research:

* 其他肿瘤治疗方法或催化剂的研究进展
* 铜单原子催化剂在体内使用时的毒性和副作用
* 多氧酸盐类催化剂通过多个含氧反应物进行并行催化反应的证据
* 铜单原子催化剂在肿瘤治疗中诱导细胞凋亡和/或坏死的实验证据
* 学术界对铜单原子催化剂在肿瘤治疗中的质疑或反驳观点
* 铜单原子催化剂在肿瘤治疗中的实际效果和局限性

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