# Article information:

Turn air-captured CO2 with methanol into amino acid and pyruvate in an ATP/NAD(P)H-free chemoenzymatic system | Nature Communications
<https://www.nature.com/articles/s41467-023-38490-w>

# Article summary:

1. Biosynthesis using CO2 as a carbon source is receiving attention for its potential to replace fossil fuels and carbohydrates in manufacturing, but it has limitations such as low driving force and limited CO2 fixation rate.

2. An approach to overcome these limitations is to combine biological and chemical syntheses, such as using energy-rich one-carbon compounds like methanol and formate in microbial metabolism or achieving CO2 fixation in cell-free synthesis.

3. The authors report on an engineered chemoenzymatic system that efficiently converts CO2 and methanol into the amino acid glycine, based on an engineered reversible glycine cleavage system with biocompatible electron-shuttle chemistry and protein engineering to enhance performance. This system could potentially be used for the biosynthesis of other amino acids and derived products from air.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

作为一篇科学论文，该文章并没有明显的偏见或宣传内容。然而，它可能存在一些片面报道和缺失的考虑点。例如，文章强调了使用CO2进行生物合成的优点，但未提及可能存在的风险和挑战，如CO2捕获和储存技术的成本和可行性问题。此外，文章也没有探讨其他可能的CO2利用途径或与使用CO2进行生物合成相关的环境影响。

另外，文章提出了一种新型化学酶系统来将空气中捕获的CO2转化为氨基酸和丙酮酸，并声称其具有高效率和可持续性。然而，在没有更多实验数据支持之前，这些主张可能需要更多证据来证明其可行性和实用性。

总体而言，该文章是一篇有价值的科学研究论文，但读者应该保持批判思维并注意到其中可能存在的局限性和不足之处。

# Topics for further research:

* CO2捕获和储存技术成本
* CO2利用途径
* 环境影响
* 实验数据支持
* 可行性
* 实用性

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