



2017-08-17

# Dietary Phytochemicals as Inhibitors of Primary Amine Oxidase

Padraig Shanahan

*Technological University Dublin, d11125149@mydit.ie*

Jeffrey O'Sullivan

*Trinity College Dublin, Ireland, JOSULLI@tcd.ie*

Keith F. Tipton

*Trinity College Dublin, Ireland, ktipton@tcd.ie*

Gemma Kinsella

*Dublin Institute of Technology, gemma.kinsella@dit.ie*

Barry J. Ryan

*Dublin Institute of Technology, barry.ryan@dit.ie*

*See next page for additional authors*

Follow this and additional works at: <https://arrow.dit.ie/schfsehart>



Part of the [Biochemistry Commons](#), [Molecular Biology Commons](#), and the [Other Biochemistry, Biophysics, and Structural Biology Commons](#)

## Recommended Citation

Shanahan, P., O'Sullivan J., Tipton, K.F., Kinsella, G., Ryan, B.J. and Henehan, G.T. (2017). Dietary phytochemical inhibitors of primary amine oxidase. *Journal of Biotechnology*, 256, S96-S97, 2017. doi.org/10.1016/j.jbiotec.2017.06.1130

This Article is brought to you for free and open access by the School of Food Science and Environmental Health at ARROW@TU Dublin. It has been accepted for inclusion in Articles by an authorized administrator of ARROW@TU Dublin. For more information, please contact [yvonne.desmond@dit.ie](mailto:yvonne.desmond@dit.ie), [arrow.admin@dit.ie](mailto:arrow.admin@dit.ie), [brian.widdis@dit.ie](mailto:brian.widdis@dit.ie).



This work is licensed under a [Creative Commons Attribution-NonCommercial-Share Alike 3.0 License](#)



---

**Authors**

Padraig Shanahan, Jeffrey O'Sullivan, Keith F. Tipton, Gemma Kinsella, Barry J. Ryan, and Gary T. Henehan

# 1 Dietary phytochemicals as inhibitors of primary amine oxidase

2 P. Shanahan<sup>1</sup>, J O'Sullivan<sup>2</sup>, KF Tipton<sup>3</sup>, GK Kinsella<sup>1</sup>, B Ryan<sup>1</sup>, GTM. Henehan<sup>1</sup>

3 1. Applied Enzymology Group, Food Science and Environmental Health, Dublin Institute of Technology, Dublin 1, Ireland.

4 2. School of Dental Sciences, Trinity College Dublin, Dublin, Ireland.

5 3. School of Biochemistry and Immunology, Trinity College Dublin, Dublin, Ireland.

6 Phytochemicals such as methylxanthines, catechins and polyphenols show health benefits in a range  
7 of diseases although their mechanism of action is not fully understood. Primary Amine Oxidase  
8 (PrAO) is widely recognised as a therapeutic drug target for the treatment of inflammatory, vascular  
9 and neurodegenerative diseases. Previous work in our laboratories showed that caffeine inhibited  
10 bovine PrAO activity with a  $K_i$  of 1.0mM. In the present study we examined a range of  
11 methylxanthines and catechins as inhibitors of bovine PrAO. The methylxanthines tested were  
12 caffeine, paraxanthine, theophylline, theobromine and 7-methylxanthine. Of these, only  
13 theobromine was an inhibitor with an  $IC_{50}$  of *ca.* 300 $\mu$ M. Calculations indicated that theobromine  
14 in foods could inhibit PrAO activity by 20%. The effect of dietary catechins; epicatechin, epicatechin  
15 gallate and epigallocatechingallate was even more significant with  $IC_{50}$  values in the micromolar  
16 region. However, inhibition by catechins was complicated by apparent activation of PrAO at high  
17 concentrations although this was not significant at physiologically attainable levels. Nonetheless,  
18 these findings indicate that a range of dietary phytochemicals could affect PrAO activity *in vivo*. We  
19 suggest that the health benefits associated with consumption of certain phytochemicals may be  
20 attributed to PrAO inhibition.

21

22