

JOINT EVENT

20<sup>th</sup> Global Congress on Biotechnology

&amp;

3<sup>rd</sup> International Conference on Enzymology and Molecular Biology

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**Inhibition of Lysyl oxidase in breast cancer cells by small-molecule inhibitors****Kathryn A Johnston and Karlo M Lopez**  
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Lysyl oxidase (LOX) is an extracellular matrix, copper-dependent, amine oxidase that catalyzes a key crosslinking step in collagen and elastin. This enzyme has also been shown to play a role in promoting metastasis. The correlation between high LOX activity and cancer metastasis is strong enough that upregulated LOX activity can be used as a diagnostic marker for the severity of cancer in patients.  $\beta$ -aminopropionitrile is a known potent inhibitor of lysyl oxidase; however, this inhibitor is not selective and, therefore, cannot be used as a therapeutic agent.  $\beta$ -aminopropionitrile has been derivatized using aromatic sidechains and has been used to selectively target lysyl oxidase in breast cancer cells. The inhibitor LP-1-2 has been shown to reduce breast cancer cell viability with a 100  $\mu$ M dose and 72-hour incubation period. The effect on cell viability increased with increasing amounts of inhibitor. The selective targeting of lysyl oxidase was verified using western blot analysis and lysyl oxidase activity assays. The activity assays showed that addition of increasing amounts of inhibitor decreased the activity of lysyl oxidase. The highest level of inhibition detected was with lysyl oxidase isolated from cells treated with 5000  $\mu$ M of LP-1-2 for 3 days, which decreased the activity three-fold as compared to lysyl oxidase isolated from untreated cells.

**Recent Publications**

1. Johnston, K. and Lopez, K. (2017) Minireview: Lysyl Oxidase in Cancer Inhibition and Metastasis, *Cancer Letters*, 417, 174 – 181.
2. Oldfield R, Johnston K, Limones J, Ghilarducci C and Lopez K (2017) Identification of histidine 303 as the catalytic base of lysyl oxidase via site - directed mutagenesis. *The Protein Journal*. Doi: 10.1007/s10930-017-9749-3.
3. Smith M A, Gonzalez J, Hussain A, Oldfield R N et al. (2016) Overexpression of soluble recombinant human lysyl oxidase by using solubility tags: effects on activity and solubility. *Enzyme Research*. 2016. Doi: 10.1155/2016/5098985.

**Biography**

Kathryn A Johnston is a fourth-year Senior Student at California State University, Bakersfield and has worked in Dr. Lopez's laboratory for the past two and a half years. During this period, she has published three papers. Her work deals primarily with the inhibition and reduction of viability of breast cancer cells using derivatized inhibitors of  $\beta$ -aminopropionitrile. She has presented her work as posters and invited talks at regional meetings, as well as national meetings of the American Chemical Society.

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**Notes:**