

## Synthesis of deuterium and tritium labeled N-acyl-L-homoserine lactones (AHLs)

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N-acyl-L-homoserine lactones (AHLs) are natural products produced by bacteria such as *Pseudomonas aeruginosa* and constitute so-called quorum sensing molecules, which mediate a cell-to-cell signalling. This inter-bacterial communication causes for example biofilm formation and thus contributes to virulence. Moreover, AHL interacts with a variety of mammalian cells (inter-kingdom signalling), what e.g. has effects in an induction of the chemotaxis of neutrophils.<sup>1-3</sup>

We are interested in the synthesis of the deuterium and tritium labeled AHLs which are easy to follow in living organisms and therefore can help to resolve still unknown mechanism of the inter-kingdom communication.

Therefore we present herein the novel method of deuterium and tritium labeling of terminally unsaturated AHLs via catalytic reduction of the double bond (see Figure 1).

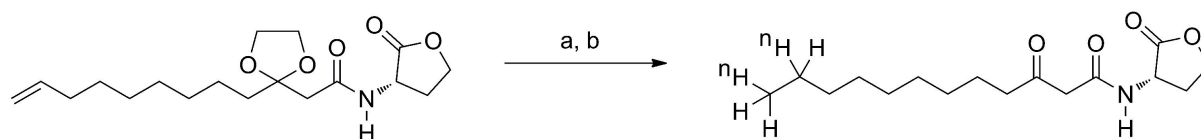


Figure 1. a) Pd(OAc)<sub>2</sub>, CH<sub>3</sub>COOH, MeOH, THF, NaB[<sup>n</sup>H<sub>4</sub>], NaOH, -196°C-RT; b) HClO<sub>4</sub>, CH<sub>2</sub>Cl<sub>2</sub>, 0°C-RT; n=2, 3.

This uncommon reduction of the double bond using sodium borohydride-[<sup>2</sup>H] or sodium borohydride-[<sup>3</sup>H] was performed in the presence of palladium(II) acetate as a catalyst in the liquid nitrogen.<sup>4</sup>

In contrary to the most of isotopic labeling methods based on the use of deuterium or tritium gas,<sup>5</sup> this procedure does not require sophisticated apparatuses and complicated work-up.

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