I welcome the comments made by Mets and I am encouraged that the original review [1] has generated interest in our understanding of the exposure process. It is indeed a complex area and one where the historical differences in terminology employed by different professions have generated some confusion.

I am glad that Mets has highlighted the work recently carried out by the International Programme on Chemical Safety (IPCS) on Risk Assessment Terminology and published by the World Health Organization in 2004 [2]. This important document is a distillation of views from a range of scientists working in occupational and environmental exposure assessment and has produced a common language to enable trans-disciplinary communication.

This IPCS glossary sets out that exposure should be clearly separated from intake and uptake. As Mets indicates, the IPCS glossary defines exposure as 'contact at an exposure surface' between the target and the agent in question. The document goes on to further define an exposure surface and give clear examples: ‘the exterior of an eyeball, the skin surface, and a conceptual surface over the nose and open mouth’. The term absorption used by Mets is replaced in the IPCS definitions by two concepts: intake and uptake. Intake is defined as the ‘process by which an agent crosses an outer exposure surface of a target without passing an absorption barrier, i.e., through ingestion or inhalation’. Uptake is more akin to absorption and is defined as the process where ‘an agent crosses an absorption barrier’.

I disagree with Mets’s argument that ‘for health professionals the term “exposure route” should therefore be avoided and renamed “absorption route”’. I think that such a move would be retrograde and would not assist the occupational and environmental health communities from bridging the existing communication gaps that often prevent us from fully understanding the important and often interlinked work carried out in each other’s discipline.

On the definition of exposure route and pathway, I think it is important to be aware that exposure pathway includes the journey that the agent takes from the source to the target and may include transfer from the source to the air compartment, then deposition to surfaces followed
by transfer from surfaces to hands. Being able to understand the complex pathways involved in the exposure process is often the first step in targeting effective occupational hygiene and engineering control measures.

It is interesting to note a recent item in the February 2006 British Occupational Hygiene newsletter where the lack of definitions of exposure in the Control of Substances Hazardous to Health (COSHH) regulations, the associated codes, guidance and other Health & Safety Executive publications were discussed. The editor’s response pondered the many problems associated with defining exposure and the need to separate exposure from uptake.

Is it perhaps time that all in occupational and environmental health, hygiene and safety engineering work together to harmonize our understanding of the scientific concepts of exposure? I would encourage readers to review the IPCS risk assessment terminology which is freely available online [2].

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References