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# ADVANCE IN THE STUDY OF THE MECHANISMS REGULATED BY SPHINGOSINE-1-PHOSPHATE

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**Abstract** Sphingosine-1-phosphate (S1P) is a bioactive lipid messenger in the cells that regulate gene expression and NF-κB signal pathway through unknown mechanisms. Recently, Cheng Luo, Associate Professor of DDDC in Shanghai Institute of Materia Medica, whose project was funded by the National Natural Science Foundation of China, joined in a research team led by Professor Sarah Spiegel of Virginia Commonwealth University. The team continuously made significant breakthroughs in understanding the regulation mechanism of Sphingosine-1-Phosphate. In September 2009, in a paper published on *Science* magazine (Science, 2009, 325: 1254—1257), they firstly demonstrated that S1P is a physiologically important regulator of histone deacetylases (HDACs), HDACs are direct intracellular targets of S1P. Furthermore, they identified the mechanism that S1P regulates gene expression through regulating the activity of HDACs. In June 24th, 2010, in another paper to be published on *Nature* magazine (Nature, 2010, June 24th, advance online publication, doi:10.1038/nature09128) which reports the regulation of NF-κB signaling pathway by S1P. They demonstrate that S1P is the missing cofactor for TRAF2 (tumour-necrosis factor receptor-associated factor 2) and indicate a new paradigm for the regulation of lysine-63-linked poly-ubiquitination. The study also highlight the key role of SphK1 and its product S1P in TNF-α signalling and the canonical NF-κB activation pathway, and then play crucial role in inflammatory, antiapoptotic and immune processes. The identification of new mechanisms by which S1P regulates gene expression and TNF and NF-κB signaling pathway will light up the road to develop novel inhibitors that might be useful for treatment of cancer and inflammatory diseases.

**Key words** S1P, SphK1, SphK2, HDAC, TRAF2, NF-κB signaling pathway

·资料·信息·

## 内生气源发泡制备泡沫镁材料获得重要进展

由中国科学院金属研究所杨院生研究员负责的国家自然科学基金面上项目"镁基泡沫材料的内生气源发泡制备与多相凝固机制"近期获得重要进展，课题组在深入研究镁熔体气-液-固多相凝固的基础上，对内生气源发泡制备泡沫镁的一系列关键问题取得重要突破，在实验室制备成功直径 135 mm 高 250 mm 的泡沫镁材料，泡沫体孔隙率 90%，表观密度 0.2 g/cm$^3$，泡孔分布均匀且尺寸稳定。力学性能和电磁性能测试结果表明，所制备的泡沫镁材料具有良好的静态和动态能量吸收特性和电磁屏蔽性能，单位体积压缩吸能能力和电磁屏蔽效能均优于泡沫铝材料。

由于镁熔体自身的性质所限，很难用熔体发泡法进行泡沫镁的制备。目前国际上对熔体发泡法制备泡沫镁均停留在实验室研究阶段，结构稳定的大尺寸泡沫镁尚未见报道。

泡沫金属是一种新型结构功能材料，泡沫镁材料因其优异的吸能和电磁屏蔽性能，使其在交通、通讯和国防等领域具有潜在的应用前景。分米级泡沫镁的研制成功，使我国内生气源发泡制备泡沫镁的研究进入了世界先进行列。

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