复合藻对D-半乳糖诱导小鼠衰老模型皮肤屏障功能的改善作用

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[摘要]目的：评价复合藻在D-半乳糖诱导小鼠皮肤衰老动物及细胞模型中对皮肤及细胞屏障功能的影响。方法：采用昆 明种小鼠（分为5组，正常对照组、模型组及复合藻低、中、高剂量组），通过给予D-半乳糖刺激建立小鼠皮肤衰老模型 及小鼠原代皮肤成纤维细胞损伤模型。检测小鼠皮肤水分，皮肤组织中羟脯氨酸（Hydroxyproline，HYP）、透明质酸 （Hyaluronic acid，HA）、胶原蛋白和纤连蛋白含量，评价复合藻干预后对小鼠皮肤衰老相关指标的影响；检测成纤维细 胞活力、胶原蛋白mRNA及蛋白表达量，评价复合藻干预后对小鼠原代皮肤成纤维细胞损伤及细胞屏障功能的影响。结果：复 合藻可以明显改善D-半乳糖刺激导致的小鼠背部皮肤水分丢失，复合藻可以明显改善皮肤中透明质酸、羟脯氨酸含量，升高 胶原蛋白和纤连蛋白含量，高剂量组与模型组比较差异均具有统计学意义（P＜0.05）。复合藻可显著改善D-半乳糖导致的 小鼠原代皮肤成纤维细胞活力降低，同时促进细胞中COL1A2和COL3A1 mRNA水平升高，高剂量组与模型组比较差异具有统计 学意义（P＜0.05）。结论：复合藻可以通过影响衰老皮肤COL1A2和COL3A1 mRNA水平，继而促进衰老皮肤胶原蛋白表达，升 高透明质酸、羟脯氨酸及含水量，改善皮肤衰老。 [关键词]复合藻；D-半乳糖；皮肤衰老；屏障功能；胶原蛋白；皮肤成纤维细胞 [中图分类号]R339.3+ 8 [文献标志码]A [文章编号]1008-6455（2022）07-0110-04

**Effect of Compound Algae on Skin Barrier Function of D-galactose-induced Mouse Aging Model**

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**Abstract: Objective** To evaluate the effect of compound algae on cell barrier function in D-galactose-induced mouse skin aging animal and cell model. **Methods** Kunming mice were used to establish skin aging model and primary skin fifi broblast injury model by giving D-galactose stimulation. They were divided into 5 groups: the normal control group, the model group and low, medium and high dose group of compound algae. The skin moisture, the content of hydroxyproline (HYP), hyaluronic acid (HA), collagen and fifi bronectin in skin tissue were detected to evaluate the effect of compound algae intervention on skin aging mice. The activity of fifi broblasts and the expression of collagen mRNA and protein were detected to evaluate the effects of compound algae on the damage of mouse primary skin fibroblasts and the function of cell barrier. **Results** Compound algae can significantly improve the water loss in the back skin of mice caused by D-galactose stimulation. Compound algae can significantly improve the contents of hyaluronic acid and hydroxyproline in the skin, and increase the contents of collagen and fibronectin. The differences between the high-dose group and the model group were statistically significant (P＜0.05). Compound algae could significantly improve the decrease of the viability of mouse primary skin fibroblasts induced by D-galactose, and promote the increase of COL1A2 and COL3A1 mRNA levels in cells. The differences between the high-dose group and the model group were statistically significant (P＜0.05). **Conclusion** Compound algae can improve skin aging by affecting the mRNA levels of COL1A2 and COL3A1 in aging skin, then promoting the expression of collagen in aging skin, increasing hyaluronic acid, hydroxyproline and water content.

**Key words:** compound algae; D-galactose; skin aging; barrier function; collagen; skin fifi broblasts