

A novel intrinsic system for endothelial stress resistance

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Blood vessels distribute entire body, supplying oxygen and nutrient. Endothelial cells (ECs) cover the entire inner lumen of the vessels and form interface between blood and vasculature; therefore receive continuous mechanical and/or chemical stresses. Accumulation of damages to ECs is thought to be the primary cause of various vascular diseases including atherosclerosis, diabetic vascular complication and so forth. We recently isolated vasohibin-1 (VASH1) as a novel angiogenesis inhibitor produced by ECs, and its homologue vasohibin-2 (VASH2). Human VASH1 gene is encoded in 14q24.3 while human VASH2 gene is encoded in 1q32.3, and these 2 molecules are highly conserved between species.

Angiogenesis is controlled by the local balance between its stimulators and inhibitors. In general, angiogenesis stimulators promote EC survival, whereas angiogenesis inhibitors induce EC death and vascular regression. Since VASH1 is synthesized by ECs and inhibits angiogenesis, VASH1 can be a suicidal molecule. We therefore characterized the role of VASH1 in EC survival/death. To our surprise, overexpression of VASH1 in ECs increased stress resistance and prevented cell death induced by cellular stresses including H₂O₂ or serum starvation, whereas the knockdown of VASH1 induced premature senescence of ECs, and those ECs were easily killed by cellular stresses. These results indicate that VASH1 plays important role not only in angiogenesis inhibition but also in vascular maintenance. The molecular mechanism of VASH1-mediated stress resistance and possible relation to glomerular function will be discussed in the meeting.

Biography

Dr. Sato is a full Professor of the Department of Vascular Biology, Institute of Development, Aging and Cancer, Tohoku University. He received his M.D. from Kobe University in 1978 and his Ph.D. from Kyushu University in 1987. He was a postdoctoral fellow at New York University Medical Center from 1987 to 1989. He returned to Oita Medical University as an assistant Professor in 1989, and promoted to the present position in 1994. He published more than 150 peer-reviewed original papers, and is now appointed as the president of the Japanese Vascular Biology and Medicine Organization.

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Ethics and law of organ transplantation: Moral paternalism V. moral pragmatism

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Shortage of available organs is a global feature of organ transplantation and has been a challenge almost since its inception. In USA, as on 20 June 2012 114730 persons are on nation's organ transplant waiting list. In India, specific studies are yet to be conducted but keeping in view the countries large population of nearly 1.2 billion and the rising incidence of ESRD, the requirement for kidney transplantation alone is expected to be around 100,000 per year. Strategies such as adoption of brain-death concept, introduction of presumed consent, routine harvesting, required request, mandated choice, enhancement of donor's upper age limit, relaxation of consanguineous riders and allowing altruistic donations from strangers have not resolved the problem. Despite stringent and fine-tuned laws most of the jurisdictions are not able to curb organ trafficking. There are reports of kidnapping and murder of children and adults to "harvest" their organs. In India there are periodic reports of organ trafficking involving clinicians, managers of clinical centres, middle-men and even state officials and several cases are under active investigation and trial. Many feel that millions of people are suffering, not because the organs are not available, but because 'morality' does not allow them to have access to the organs. Arguments against organ sale are grounded in two broad considerations: (1) sale is contrary to human dignity (2) sale is violative of equity. In this article I examine both the objections and conclude that they reflect a state of moral paternalism rather than pragmatism. The issue of biotechnological achievements and their social assimilation contemplates a much deeper dialogue than what is being done in the contemporary ethical discussions. This paper is an attempt in that direction.

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