SANJEEV GUPTA, M.D.

Positions:

Professor, Department of Medicine, and of Pathology
Member, NIH Centers for Liver, Diabetes, and Cancer
The Eleazar and Feige Reicher Chair in Translational Medicine, Albert Einstein College of Medicine
Director, Translational Technologies, Institute for Clinical and Translational Research,
Albert Einstein College of Medicine and Montefiore Medical Center
Attending Physician (Gastroenterology and Liver Diseases), Montefiore Medical Center

Research interests:

Our research is focused on cell therapy with liver-directed applications. This requires insights into the potential of candidate donor cells, including stem cell–derived cells. Differentiation of stem cells is of interest to us for generating hepatocytes. Mechanisms are defined for transplanted cells to repopulate organs. How specific cell types may be useful is studied for correcting diseases. We established a number of principles for how livers could be repopulated with cells, how genetic and acquired conditions could be corrected in animal models and how specific cell types could be important in these efforts. Most recently, we discovered that paracrine signaling from transplanted cell types, including stem cell–derived cells, can promote liver regeneration. This rescues animals in acute liver failure. These mechanisms are relevant for treating liver failure in people. Similarly, we discovered that liver endothelial cells produce FVIII and corrected hemophilia in a mouse model with endothelial cell transplantation as well as with bone marrow transplantation. Wilson's disease with copper toxicosis can be cured by transplantation of healthy cells. We continue to define the nature of human pluripotent and fetal endoderm-derived hepatic cells. Pursuit of tissue engineering and cell therapy approaches in models of liver failure, hepatitis, and Wilson disease aims at clinical translation.

Current grant funding:

2R01 DK071111 (Gupta)	07/01/2012–06/30/2019 Transplantation of endothelial cells
5P30 DK041296 (Wolkoff) NIH/NIDDK	06/01/2014–05/31/2019 Liver pathobiology and gene therapy research core center (Gupta) Director, Animals Models, Stem Cells and Cell Therapy Core

Five recent publications:

1. Bandi S, Gupta S, Tchaikovskaya T, Gupta S. Differentiation in stem/progenitor cells along fetal or adult hepatic stages requires transcriptional regulators independently of oscillations in microRNA expression. Exp Cell Res 2018; https://www.sciencedirect.com/science/article/pii/S0014482718303306.
2. Benten D, Kluwe J, Wirth JW, Thiele ND, Follenzi A, Bhargava KK, Palestro CJ, Koepke M, Tjandra R, Volz T, Lutgehetmann M, Gupta S. A humanized mouse model with liver fibrosis following expansion of transplanted hepatic stellate cells in injury and inflammation. Lab Invest 2018 Jan 19. doi:10.1038/s41374-017-0010-7. PMID: 29352225,
3. Viswanathan P, Sharma Y, Gupta P, Gupta S. Replicative stress and alterations in cell cycle checkpoint controls following acetaminophen hepatotoxicity restrict hepatic regeneration. Cell Prolif 2018; Mar 5. doi: 10.1111/cpr.12445. PMID: 29504225,
4. Kakabadze Z, Kakabadze A, Chakhunashvili D, Karalashvili L, Berishvili E, Sharma Y, Gupta S. Decellularized human placenta supports hepatic tissue and allows rescue in acute liver failure. Hepatology 2018 May;67(5):1956-1969. PMID: 29211918.
5. Merlin S, Bhargava K, Ranaldo G, Zanolini D, Palestro C, Santambrogio L, Prat M, Follenzi A, Gupta S. Kupffer cell transplantation in mice for elucidating monocyte/macrophage biology and for potential in cell or gene therapy. Am J Pathol 2016 Mar;186(3):539-51. PMID: 26773351