

**University of Pittsburgh
School of Medicine**

BIOGRAPHICAL

Name: Ajai Khanna

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EDUCATION AND TRAINING

UNDERGRADUATE:

<u>Dates Attended</u>	<u>Name and Location of Institution</u>	<u>Degree Received & Year</u>
8/77 – 6/82	Motilal Nehru Medical College Allahabad, India	M.D., 1983

GRADUATE:

<u>Dates Attended</u>	<u>Name and Location of Institution</u>	<u>Degree Received & Year</u>
9/83 - 6/87	University of Allahabad Medical School Allahabad, India	M.S., 1987
9/98-6/00	University of Manchester United Kingdom Immunology	Ph.D., 2000
7/04 - 6/06	Rady School of Management University of California, San Diego California, USA	MBA, 2006

POST-GRADUATE:

<u>Dates Attended</u>	<u>Name and Location of Institution</u>	<u>Program Director/Discipline</u>
7/82 - 6/83	University of Allahabad Allahabad, India	Nandlal Tahiliani MS FRCS Internship General Surgery
7/83 - 6/87	University of Allahabad Allahabad, India	Nandlal Tahiliani MS FRCS MS Residency General Surgery
7/87 - 6/88	Cancer Institute	V Shanta M.D

	University Madras Hospital Chennai, India	Clinical Instructor Surgical Oncology
9/88 - 10/93	University Hospitals of Aberdeen London, United Kingdom	Norman A Matheson, M.D Residency General Surgery
1/94 - 12/95	University of Pittsburgh School of Medicine Thomas E. Starzl Institute Pittsburgh, PA, USA	John J Fung M.D, MD., Ph.D Fellow/Instructor Multi-Organ Transplant Surgery
1/96 - 9/98	University of Pittsburgh School of Medicine Thomas E. Starzl Institute Children's Hospital of Pittsburgh Pittsburgh, PA, USA	John J Fung M.D, MD., Ph.D Fellow/Instructor Intestinal, Multi-visceral Pediatric Abdominal Transplantation
1/96 - 9/98	University of Pittsburgh School of Medicine Thomas E. Starzl Institute Children's Hospital of Pittsburgh Pittsburgh, PA, USA	Angus W. Thomson DSc, Ph.D Post-Doctoral Fellow Transplant Immunology

APPOINTMENTS AND POSITIONS

ACADEMIC:

7/86 – 7/88	University of Allahabad, India	Instructor in Surgery
9/88 – 3/89	Aberdeen Royal Infirmary University of Aberdeen, UK	Clinical Assistant in General Surgery
4/89 – 9/93	University Hospitals of Aberdeen and Manchester, UK	Registrar in Surgery
10/93 – 11/93	St. George's Hospital and Medical School University of London, UK	Instructor/Senior Registrar in General Surgery
1/94 – 9/98	University of Pittsburgh School of Medicine Thomas E. Starzl Transplantation Institute Pittsburgh, PA, USA	Instructor in Transplantation Surgery
10/98 – 6/02	University of California School of Medicine San Diego, CA, USA	Transplant Surgeon and Assistant Professor of Surgery

7/02 – 6/08	University of California School of Medicine San Diego, CA, USA	Transplant Surgeon and Associate Professor of Surgery Department of Surgery
7/08 – 6/13	University of California School of Medicine San Diego, CA, USA	Transplant Surgeon and Professor of Surgery
2/13 – 6/13	Oregon Health Science University School of Medicine Portland, OR, USA	Transplant Surgeon and Professor of Surgery Department of Surgery
7/13 – 4/17	The Cleveland Clinic Case Western Reserve University Lerner College of Medicine Cleveland, OH, USA	Transplant Surgeon Director, Intestinal and Multivisceral Transplant Program Professor of Surgery
7/13 – 4/17	The Cleveland Clinic Case Western Reserve University Lerner School of Medicine Cleveland, OH, USA	Staff Surgeon, Intestinal and Multivisceral Transplant Program Professor of Surgery
5/17 - Present	Division of Transplant Surgery University of Pittsburgh School of Medicine Pittsburgh, PA, USA	Transplant Surgeon and Professor of Surgery

NON-ACADEMIC:

1998- 2011	Liver and Kidney Transplant Selection Committee, UCSD Medical Center Rady Children’s Hospital of San Diego	Chair
1998- 2011	Liver and Kidney Transplant QA Committee UCSD Medical Center Rady Children’s Hospital	Chair
1999-2011	Abdominal Transplant Programs Rady Children’s Hospital of San Diego Transplant Service University of California San Diego	Director
1999-2011	Live Donor Liver Transplant Programs Rady Children’s Hospital Transplant Service University of California San Diego	Director
2000-2004	Credentials Committee UCSD Medical Center	Member
2004-2013	Kidney and Kidney-Pancreas Programs	Director

	University of California, San Diego	
2004-2013	Rebecca and John Moores Cancer Center University of California, San Diego	Member
2006 – 2009	Abdominal Transplant Programs and Section Chief Abdominal University of California, San Diego	Interim Director
2006- 2009	Liver and Kidney Transplant Selection Committee UCSD Medical Center	Chair
2006- 2009	QA Committee, Abdominal Transplant Programs, UCSD Medical Center	Chair
2006-2013	University of California, San Diego Clinical Investigation Institute	Member
2009-2010	Search Committees at UCSD Medical Center	Member
2010- 2013	Live Donor Liver Transplant Program UCSD	Primary Surgeon
2013-2017	Intestinal and Multivisceral Transplant Surgical Director The Cleveland Clinic, Ohio, USA	Transplant Surgeon
2014-2017	Quality Committee Intestinal and Multivisceral Transplantation The Cleveland Clinic Digestive Disease Institute	Chair

CERTIFICATION AND LICENSURE

Specialty Certification:

European Board of Transplant Surgery	2009
FEBS Fellow European Board of Surgery	2009
FACS Fellow, American College of Surgeons	2005
Certification American Society for Transplant Surgeons	1998
Specialist Certification in General Surgery, Royal Colleges of Surgeons of England, United Kingdom	1997
FRCS Fellow, The Royal College of Surgeons of England	1990
FRCS Fellow, The Royal College of Physicians and Surgeons of Glasgow	1990
Certification in Robotic Surgery	2010

MEMBERSHIP IN PROFESSIONAL AND SCIENTIFIC SOCIETIES

Organization

- Society of University Surgeons
- Association for Academic Surgery
- Intestinal Transplant Association
- American College of Surgeons
- American Society of Transplant Surgeons
- American Association for Study of Liver Diseases
- American Association of Physicians of India
- Royal College of Surgeons of England
- Royal College of Physicians and Surgeons of Glasgow
- International Liver Transplant Society
- International Pediatric Transplant Association
- Indian Medical Association
- The Transplantation Society
- European Society for Organ Transplantation
- Asian Pacific Association for Study of Liver
- Association of Surgeons of India

HONORS AND AWARDS

Title of Award	Year
Rotary International Award for Professionalism	1986
Young Investigator Award American Society for Transplant Surgeons	1996
Outstanding Intellectuals of the 21 st Century	2000
Nominated for Kaiser Medical Student Excellence in Teaching Award	2008
Nominated for Kaiser Medical Student Excellence in Teaching Award	2009

SELECT PUBLICATIONS

Refereed articles

1. **Khanna A**, Gandhi A, Sykes PA. Blunt abdominal injury associated with colonic rupture into abdominal muscles – a case report. *Injury* 1995; 26(5):337-338. PMID: 7649653.
2. Egidi MF, Shapiro R, **Khanna A**, Fung JJ, Corry RJ. Fine-needle aspiration biopsy in pancreatic transplantation. *Transplant Proc* 1995; 27(6):3055-66. PMID: 8539841.
3. Iyengar A.R., Bonham C.A., Antonysamy M.A., Subbotin V.A., **Khanna A.**, Murase N., Rao A.S., Starzl T.E., Thomson A.W. Striking augmentation of hematopoietic cell chimerism in non-cytoablated allogeneic bone marrow recipients by Flt3 ligand and Tacrolimus. *Transplantation-Rapid Communication* 1997; 63(9).

4. **Khanna A**, Newman B, Reyes J, Todo S, Fung JJ, Starzl TE. Internal hernia and volvulus of small bowel following liver transplantation. (original article) *Transpl Intl* 1997; 10(2):133-136. PMID: 9089999.
5. **Khanna A**, Jain A, Ziady G, Demetris AJ, Fung JJ, Kramer D, Starzl TE. Cardiac changes at autopsy on adult liver transplant recipients under Tacrolimus. *Transplant Proc* 1997; 29:532-533. PMID: 9123118.
6. Antonysamy MA, Steptoe RJ, **Khanna A**, Subbotin VA, Rudert WA, Thomson AW. Flt-3 promotes microchimerism but can augment anti-donor immunity. *J. Immunol* 1998; 160:4106-13. PMID: 9558122.
7. **Khanna A**, Steptoe RJ, Li W, Morris RE, Thomson AW. Donor bone marrow potentiates the effect of Tacrolimus on non-vascularized heart allograft survival. *Transplantation* 1998; 65:479-485. PMID: 9500620.
8. **Khanna A**, Antonysamy MA, Subbotin VM, Steptoe RJ, Li W, Rudert WA, Thomson AW. Impact of Flt-3 ligand on donor-derived antigen presenting cells and alloimmune reactivity in heart graft recipients given adjuvant donor bone marrow. *Transpl Immunol* 1998; 6:225-234. PMID: 10342736.
9. Molmenti E, Mazariegos G, Bueno J, Cacciarelli T, Alasio T, **Khanna A**, Kosmach B, Jain A, Fung J, Reyes J. Noncompliance after pediatric liver transplantation. *Transplant Proc* 1999; 31(1-2):408. PMID: 10083164.
10. Jordan ML, Shapiro R, Gritsch HA, Egidi F, **Khanna A**, Vivas CA, Scantlebury VP, Fung JJ, Starzl TE, Corry RJ. Long-term results of pancreas transplantation under Tacrolimus. *Transplantation* 1999; 67(2):266-272. PMID: 10075592.
11. Patzer J, Mazariegos G, Lopez R, Molmenti E, Gerber D, Riddervold F, **Khanna A**, Yao Yin W, Chen Y, Scott V, Aggarwal S, Kramer D, Wagner R, Zhu Y, Fulmer M, Block G, Amiot B. Novel bio-artificial liver support system: preclinical evaluation. *Ann NY Acad Sci* 1999; 875:340-352. PMID: 10415580.
12. Song Z, **Khanna A**, Patel NH, Dindal RM. Is specific immunosuppression necessary for pancreas transplantation? *Curr Opin Organ Transpl* 2001; 6:188-193.
13. Rose SC, Andre MP, Roberts AC, Kinney TB, Valji K, Ronaghi AH, Hassanein TI, Lavine JE, Hart ME, **Khanna A**. Integral role of interventional radiology in the development of a pediatric liver transplantation program. *Pediatric Transplantation* 2001; 5:331-338. PMID: 11560751.
14. Jain A, Mazariegos G, Kashyap R, Marsh W, **Khanna A**, Iurlano K, Fung JJ. Reasons why some children receiving Tacrolimus therapy require steroids more than five years post liver transplantation. *Transplantation* 2001; 5(2):93-98. PMID: 11328546.
15. Jain A, Kashyap R, Marsh W, Rohal S, **Khanna A**, Fung JJ. Reasons for long-term use of steroid in primary adult liver transplantation using Tacrolimus. *Transplantation* 2001; 71(8):1102-06. PMID: 11374410.
16. Haque T, Taylor C, Wilkie GM, Murad P, Amot PL, Beath S, McKiernan PH, Crawford DH. Complete regression of post-transplant lymphoproliferative disease using partially HLA-matched Epstein-Barr virus-specific cytotoxic T cells. *Transplantation* 2001; 72:1352-53. **Khanna A**.

17. Patel NH, Revanur VK, **Khanna A**, Hodges C, Jindal RM. Vascular access for hemodialysis: an in-depth review. *J Nephrol* 2001; 14(3):146-156.
18. Chapman WC, Clavien PA, Fung J, **Khanna A**, Bonham A. Effective control of hepatic bleeding with a novel collagen-based composite combined with autologous plasma. *Arch Surg* 2000; 135:1200-04. DOI:10.1001/archsurg.135.10.1200.
19. **Khanna A**, Morelli AE, Zhong C, Takayama T, Lu L, Thomson AW. Effects of liver-derived dendritic cell progenitors on Th1- and Th2-like cytokine response in vitro and in vivo. *J Immunol* 2000; 164(3):1346-54. DOI:10.4049/jimmunol.164.3.1346.
20. Morelli AE, O'Connell PJ, **Khanna A**, Logar AJ, Lu L, Thomson AW. Preferential induction of TH1 responses by functionally mature hepatic (CD8 α ⁻ and CD8 α ⁺) dendritic cells. *Transplantation* 2000; 69(12):2647-57. PMID: 10910289.
21. Rose SC, Hassanein TI, Bouvet M, Hart ME, **Khanna A**. Delivery of radiofrequency ablation probes to the targeted liver malignancy: using all the players on the field. *J Vasc Interv Radiol* 2002; 13(10):1060-61. PMID: 12397131.
22. Nyhan W, **Khanna A**, Barshop B, Naviaux R, Precht AF, Lavine JE, Hart M, Hainline BE, Wappner RS, Nichols S, Haas M. Pyruvate carboxylase deficiency—insights from liver transplantation. *Mol Genet Metab* 2002; 77:143-149. PMID: 12359142.
23. Patzer JF II, Block GD, **Khanna A**, Yin WY, Molmenti E, Gerber D, Kramer DJ, Scott VL, Aggarwal S, Wagner RA, Fulmer ML, Amiot BP, Mazariegos GV. D-galactosamine based canine acute liver failure model. *Hepatobiliary Pancreat Dis Int* 2002; 1(3):354-367. PMID: 14607707.
24. Hong IC, Mullen PM, Precht AF, **Khanna A**, Li M, Behling C, Lopez V, Chiou H, Moss R, Hart M. Non-viral human IL-10 gene expression reduces acute rejection in heterotopic auxiliary liver transplantation in rats. *Microsurgery* 2003; 23:432-436. DOI: 10.1002/micr.101074.
25. Barshop BA, Nyhan WL, Gwynne J, Paynard-Davis J, **Khanna A**. Liver transplantation in maple syrup urine disease, including domino transplantation. *Mol Genet Metab* 2005; 3:213-214.
26. Barshop BA, **Khanna A**. Domino hepatic transplantation in maple syrup urine disease. *N Engl J Med* 2005; 353(22):2410-11.
27. Laving A, **Khanna A**, Rubin L, Ing F, Dohil R, Lavine JE. Successful liver transplantation in a child with severe portopulmonary hypertension treated with epoprostenol. *J Pediatrics Gastroenterol Nutr* 2005; 41(4):466-468. PMID: 16205516.
28. Grover I, Conley L, Alzate G, Lavine J, Van Hoesen K, **Khanna A**. Hyperbaric oxygen therapy for hepatic artery thrombosis following liver transplantation: current concepts. *Pediatr Transpl* 2006; 10(2):234-239. PMID: 16573613.
29. **Khanna A**, Hart M, Nyhan WL, Hassanein T, Panyard-Davis J, Barshop BA. Domino liver transplantation in maple syrup urine disease. *Liver Transplant* 2006; 12(5):876-82. PMID: 16628687.

30. Bodor R, Greenberg JI, Abrams RA, Obiekwe S, Hart M, Lavine JE, **Khanna A**. Microvascular hepatic artery reconstruction in pediatric abdominal transplantation: pearls and pitfalls. *Pediatric Transplant*. 2007 Aug;11(5):471-6. PMID: 17631013.
31. Ng VL, Fecteau A., Shepherd R., Magee J., Bucuvalas J., Alonso E., McDiarmid S., Cohen G., Anand R.; Studies of Pediatric Liver Transplantation Research Group. Outcomes of 5-year survivors of pediatric liver transplantation: report on 461 children from a North American multicenter registry. *Pediatrics*. 2008 Dec;122(6):e1128-35.
32. Hemming AW, Mekeel K, **Khanna A**, Baquerizo A, Kim RD. Portal vein resection in management of hilar cholangiocarcinoma. *J Am Coll Surg*. 2011 Apr;212(4):604-13. PMID: 21463797.
33. **Khanna A**, Horgan S. A laboratory training and evaluation technique for robot assisted ex vivo kidney transplantation. *Int. J Med Robot*. 2011 Mar; 7(1):118-22. DOI: 10.1002/rcs.379.
34. Lwin WW, Park K, Wauson M, Gao Q, Finn PW, Perkins D, **Khanna A**. Systems Biology Approach to Transplant Tolerance: Proof of Concept Experiments Using RNA Interference (RNAi) to Knock Down Hub Genes in Jurkat and HeLa Cells in Vitro. *J Surg Res*. 2012 Jul;176(1):e41-6. DOI: 10.1016/j.jss.2011.12.002.
35. Franko KR, Mekeel KL, Woelkers D, **Khanna A**, Hemming AW. Accidental acetaminophen overdose results in liver transplant during second trimester of pregnancy: a case report. *Transplant Proc*. 2013 Jun;45(5):2063-5. PMID: 23769109.
36. Firth AL, Dargitz CT, Qualls SJ, Menon T, Wright R, Singer O, Gage FH, **Khanna A**, Verma IM. Generation of multiciliated cells in functional airway epithelia from human induced pluripotent stem cells. *Proc Natl Acad Sci U S A*. 2014 Apr 29;111(17):E1723-30. DOI: 10.1073/pnas.1403470111.
37. Firth AL, Menon T, Parker GS, Qualls SJ, Lewis BM, Ke E, Dargitz CT, Wright R, **Khanna A**, Gage FH, Verma IM. Functional Gene Correction for Cystic Fibrosis in Lung Epithelial Cells Generated from Patient iPSCs. *Cell Rep*. 2015 Sep 1;12(9):1385-90. PMID: 2629960.
38. Hashimoto K, Costa G, **Khanna A**, Fujiki M, Quintini C, Abu-Elmagd K. Recent Advances in Intestinal and Multivisceral Transplantation. *Adv Surg*. 2015;49(1):31-63. PMID: 26299489.
39. **Khanna A**, Gish R, Winter SC, Nyhan WL, Barshop BA. Successful Domino Liver Transplantation from a Patient with Methylmalonic Acidemia. *JIMD Rep*. 2015 Jul 29.
40. Kandeel A, Abu-Elmagd K, Spinner M, **Khanna A**, Hashimoto K, Fujiki M, Parsi M, Bennett A, El-Gazzaz G, Abd-Elaal A. Atypical Clinical Presentation of a Newer Generation Anti-Fungal Drug-Resistant Fusarium Infection After a Modified Multi-Visceral Transplant. *Ann Transplant*. 2015 Sep 3;20:512-8. PMID: 26334671.
41. Abu-Elmagd KM, Costa G, McMichael D, **Khanna A**, Cruz RJ, Parekh N, Fujiki M, Hashimoto K, Quintini C, Koritsky AD, Kroh MD, Sogawa H, Kandeel A, da Cunha-Melo JR, Steiger E, Kirby D, Matarese L, Shatnawei A, Humar A, Walsh RM, Schauer PR, Simmons R, Billiar T, Fung J. Autologous Reconstruction and Visceral Transplantation for Management of Patients with Gut Failure After Bariatric Surgery: 20 Years of Experience. *Ann Surg*. 2015 Oct;262(4):586- 601. PMID: 26366538.

42. Koval CE, Khanna A, Pallotta A, Spinner M, Taege AJ, Eghtesad B, Fujiki M, Hashimoto K, Rodriguez B, Morse G, Bennett A, Abu-Elmagd K. En Bloc Multivisceral and Kidney Transplantation in an HIV Patient: First Case Report. *Am J Transplant*. 2015 Oct 5. DOI: 10.1111/ajt.13455.

Reviews, Invited Published Papers and Book Chapters

1. **Khanna A.**, Fung J.J. Liver transplantation. In: *Blue Books of Practical Neurology, "Neurologic Complications in Organ Transplantation."* Eelco (ed.). F.M. Wijdick, Mayo Clinic, Rochester MN; 1999, 21, pp. 19-31.
2. **Khanna A.**, Thomson A.W. *Hematopoietic Growth Factors in Transplantation: Biology and clinical applications* (review article). *Transplant Rev* 1998; 12:121-139..
3. **Khanna A.**, Rosenbloom A., Bonham C.A., Fung J.J. In: *Textbook of Critical Care*, 4th edition, chap. 178. S.M. Ayers, A. Grenvik, P.R. Holbrook, W.C. Shoemaker (eds.). W.B. Saunders Co., Philadelphia; 1999, pp. 1925-38.
4. **Khanna A.**, Jain A., Eghtesad B., Rakela J. *Liver Transplantation for Metabolic Liver Diseases*. *Surg Clin North Am* 1999; 79:153-162.
5. Jain A., **Khanna A.**, Molmenti E.P., Rishi N., Fung J.J. *Immunosuppressive Therapy: New Concepts*. *Surg Clin North Am* 1999; 79:59-76.
6. **Khanna A.**, Patel N.H., Song Z., Jindal R.M. Pancreas transplantation. In: *Ultrasound of Abdominal Transplantation*. Eds: Pal S. Sidhu, Grant M. Baxter; Thieme & Stuttgart, New York, 2002, pp. 125-130.
7. **Khanna A.**, Jindal R.M. Small bowel and multi-visceral transplantation. In: *Ultrasound of Abdominal Transplantation*. Pal S. Sidhu, Grant M. Baxter (eds.); Thieme & Stuttgart, New York, 2002, pp. 131-135.
8. **Khanna A.** Are Natural Orifice Transluminal Endoscopic Surgery (NOTES) and Single Incision Surgery (SIS) viable techniques for cholecystectomy? *Journal of Laparoendoscopic & Advanced Surgical Techniques* 2011. DOI: 10.1089/lap.2012.9999.
9. Hart M.E., **Khanna A.**, Dunn J.F. Organ transplantation. In: *Essential Surgical Practice/Higher Surgical Training*, 4th edition, chap. 64. A. Cuschieri, R.J.C Steele, A.R. Moossa (eds.). Arnold, London, UK; 2002, pp. 1343-56.
10. Fulminant Liver Failure: *When to Transplant?* **Khanna A.**; Hemming A.W.: *Surgical Clinics of North America*, June 2010 *Surg Clin North Am*. 2010 Aug; 90(4):877-89. Epub 2010 Jun 9.
11. Intestinal and Multivisceral Transplantation: An update in the milieu of gut rehabilitation **Ajai Khanna**, Masato Fujiki, Koji Hashimoto, Guilherme Costa, Cristiano Quintini, Kadakkal Radhakrishnan, Kareem Abu-Elmagd: *Pediatric Gastrointestinal and Liver Disease: Pathophysiology/ Diagnosis/ Management* by Robert Wyllie MD, Jeffrey S. Hyams MD, Marsha KaY: Elsevier, Amsterdam 2014

12. Soltys KA, Bond G, Sindhi R, Rassmussen SK, Ganoza A, **Khanna A**, Mazariegos G. Pediatric intestinal transplantation. *Semin Pediatr Surg.* 2017 Aug;26(4):241-249
13. Bharadwaj S, Tandon P, Gohel TD, Brown J, Steiger E, Kirby DF, **Khanna A**, Abu-Elmagd K. Current status of intestinal and multivisceral transplantation. *Gastroenterol Rep (Oxf).* 2017 Jan 26.
14. The Enigma of Gut Failure after Bariatric Surgery: Clinical Types and Surgical Ingenuity: Kareem M Abu-Elmagd, Ajai Khanna, Masato Fujiki, Koji Hashimoto, Tomasz Rogula, and Guilherme Costa” In *Bariatric Surgery: Complications*
15. *Anesthesia and Perioperative Care for Organ Transplantation* Ahmed Nassar, Masato Fujiki, Ajai Khanna, Koji Hashimoto, Cristiano Quintini, Guilherme Costa, Kareem Abu-Elmagd. Drs. Subramanian and Sakai (Editors) 2017 Springer Verlag