

## Yongquan Gu



Prof. Yongquan Gu has been working on the clinical treatment and research of vascular diseases for more than 30 years with many innovations in angiogenesis. He was the first doctor to treat critical limb ischemia by endovascular injection of autologous mononuclear cells and led the first RCT study to compare the effects of local muscular injection and endovascular injection of mononuclear cells for treating severe limb ischemia in the world. He produced inspiring results of transplanting mononuclear cells harvested following bone marrow mobilization to treat critical limb ischemia. He also found the positive dose-effect correlation of mononuclear cell transplantation for limb ischemia in the world. He fulfilled the pilot clinical study of naked DNA expressing two isoforms of hepatocyte growth factor to treat patients with critical limb ischemia. He improved the surgical technique for treating diabetic feet with severe limb ischemia, which resulted in a lowered major amputation rate of less than 1% in the patients with critical limb ischemia. He was the first doctor to treat limb ischemia with tissue engineering graft resulting in a satisfactory outcome in the world.

For the treatment of cerebral ischemia from Takayasu' disease, he suggested staging carotid blood flow reconstruction and intraoperative cerebral blood flow monitoring with Doppler ultrasonography. The surgery success rate was 100% with no perioperative death; He invented

carotid artery and vertebral artery atherectomy with the TurboHawk device plus drug-coated balloon angioplasty. He treated thoracoabdominal aortic aneurysms with the modified octopus endovascular technique as the first one in the world.

He has 12 approved national patents and published 324 dissertations. As chief editor, he has published 14 monographs. In 2015, Prof. Gu won China Medical Science and Technology Progress Award, the top medical award of China. He also won other 4 first prizes, 2 second prizes and one third prize in the advancement of science and technology, at a provincial and ministerial level.

**PROJECT MANAGEMENT, GRANTS OR FUNDING RECEIVED:**

1. National 863 Program Eleventh Five-Year Major Project: Basic and Applied Research on Small-Caliber Arterial Tissue Engineering. Project Number: 2006AA02A134. Duration: 2006.12-2010.12. Total funding: 2.41 million RMB. Principal Investigator.

2. Capital Medical Development Foundation - Joint Research Project: Clinical Study on Integrated Treatment of Diabetic Foot in Internal and Surgical Medicine. Project Number: 2002-1013. Duration: 2002.11-2007.10. Total funding: 700,000 RMB. First Principal Investigator.

3. Beijing Natural Science Foundation: Comparative Study on the Treatment of Limb Ischemic Diseases with Subpopulations of Bone Marrow-Derived Stem Cells. Project Number: 7072031. Duration: 2007.03-2009.03. Total funding: 130,000 RMB. Project Leader.

4. Beijing Excellent Talent Foundation: Clinical Study on Integrated Treatment of Diabetic Foot in Internal and Surgical Medicine. Duration: 2004.01-2005.12. Total funding: 35,000 RMB. Project Leader.

5. National 863 Program: Research on Transgenic Pigs for Clinical Organ Transplantation. Subproject: Study on Tissue Engineered Blood Vessels. Project Number: 2001AA216071. Duration: 2001.09-2004.10. Total funding: 360,000 RMB. Main researcher, Subproject leader for Tissue Engineered Venous Blood Vessels - Project completed.

6. Beijing Municipal Science and Technology Commission Major Project (Clinical Application and Industrialization of Tissue-Engineered Human Tissues and Organs): Research on Clinical Application and Industrialization of Tissue-Engineered Venous Blood Vessels. Project Number: H020920040330. Duration: 2002.01-2006.12. Total funding: 4 million RMB. Main researcher.
7. National Natural Science Foundation of China funded project: Study on Transplantation of Endothelial Progenitor Cells Transfected with Nitric Oxide Synthase Gene for the Treatment of Chronic Lower Limb Ischemia. Project Number: 30471708. Duration: 2005.01-2007.12. Funding: 210,000 RMB. Third Principal Investigator.
8. Beijing Natural Science Foundation: Study on Intravascular Biodegradable Polymer Stents. Project Number: 7052031. Duration: 2005.01-2007.12. Funding: 160,000 RMB. Main Participant.
9. Beijing Municipal Health Bureau: Talent Specialization Project for the Ten Thousand Hundred Talent Program in Health. Duration: 2009. Funding: 30,000 RMB. Project Leader
10. Beijing Municipal Health Bureau: High-level Health Technical Talent Training Program in Beijing's Health System - Discipline Backbone. Duration: 2010-2012. Project Number: 2009-3-59. Funding: 210,000 RMB. Project Leader.
11. Preclinical Evaluation and Clinical Study of Stem Cell Transplantation for Heart Failure: National 863 Program. Duration: 2011-2012. Funding: 344,700 RMB. Subproject Leader. Project Number: 2011AA020101.
12. Development of Tissue Engineering Construction Techniques and Products for Structural Tissues: National 863 Program. Duration: 2012-2015. Funding: 1 million RMB. Subproject Leader. Project Number: 2012AA020507.
13. Research on the Efficacy of Plaque Excision for the Treatment of Diabetic Lower Limb Arteriosclerotic Occlusive Disease: Beijing Municipal Science and Technology Plan.

Duration: 2014.6-2017.9. Funding: 225,000 RMB. Project Leader. Project Number: Z141107002514063.

14. Beijing Hospital Management Bureau's "Dengfeng Project" Talent Training Program: 2016.1 - 2019.12. Project Funding: 1,823,000 RMB. Project Leader.

15. Beijing Municipal Health Bureau's Yangfan Plan - Multicenter Randomized Controlled Study Comparing the Efficacy of Plaque Excision and Stent Formation in the Treatment of Diabetic Lower Limb Arteriosclerotic Occlusive Disease: 2016.1 - 2018.12. Project Funding: 866,600 RMB. Project Number: XMLX201610. Project Leader.

16. Beijing Municipal Science and Technology Commission and Beijing Municipal Health Commission: Capital Medical Development Fund - Clinical Translation Project: Clinical Translation Research of Decellularized Artificial Blood Vessels: 2015 - 2018.12. Project Funding: 1,470,000 RMB. Project Leader. Project Number: Shoufa2016-1-2012.

17. Beijing Science and Technology Plan - Promotion and Application of Surgical Intervention Standardized Treatment Protocol for Diabetic Lower Limb Arteriosclerotic Occlusive Disease: 2012.7 - 2014.7. Project Funding: 60,500 RMB. Project Number: Z121100005512009. Project Leader.

18. Capital Medical University Xuanwu Hospital Institutional Project - Key Project for the Elderly: Clinical Study of Umbilical Cord Blood Stem Cell Transplantation for Severe Lower Limb Ischemia: 2016.1 - 2017.12. Project Funding: 150,000 RMB. Project Leader.

19. National Key Research and Development Program during the 13th Five-Year Plan Period - Research and Development of Human Structural Tissue Engineering Construction Techniques and Products for Small-caliber Blood Vessels, Bone, Cartilage, etc.: 2017.7 - 2020.12. Project Funding: 14,300,000 RMB. Project Leader, Chief Expert. Project Number: 2017YFC1104100.

20. National Key Research and Development Program during the 14th Five-Year Plan Period - Research and Promotion of Comprehensive Prevention and Control System for Vascular

Diseases: Exploration of Standardized Treatment for Vascular Diseases, 2021.12 - 2024.11.

Project Leader. Project Funding: 4,340,000 RMB. Project Number: 2021YFC2500504.

21. National Major Science and Technology Special Project - Recombinant Hepatocyte Growth Factor Naked Plasmid Injection, Project Number: 2008ZX09101-052, Co-Principal Investigator, 2009-2012, Project Funding: 3,500,000 RMB.

**HONORS AND AWARDS:**

1. In 1998, received the First Prize for Science and Technology Progress from the Ministry of Posts and Telecommunications, for the "Innovation in Surgical Treatment of Large Artery Vasculitis", as the Second Contributor. Certificate Number: 98108.

2. In 1996, received the Second Prize for Science and Technology Progress from the Ministry of Posts and Telecommunications, for "the Surgical Treatment of Superior Vena Cava Syndrome", as the Fifth Contributor. Certificate Number: 96231.

3. In 2006, received the Third Prize for Science and Technology Progress from Beijing Municipality, for "the Basic and Clinical Research on Minimally Invasive Interventional Treatment of Large Vascular Diseases", as the Second Contributor.

4. In 2009, received the Second Prize for Science and Technology Progress from Beijing Municipality, for "the Clinical Research on Surgical Treatment of Lower Limb Ischemia in Diabetes", as the First Contributor. Certificate Number: 2009YI-2-006-01. Contributors: Gu Yongquan, Han Zhongchao, Zhang Jian, etc.

5. In 2006, received the First Prize for Medical New Technology Achievement from the Clinical Technology Application Management Professional Committee of the Chinese Hospital Association (MTA), for "the Autologous Bone Marrow Stem Cell Transplantation for the Treatment of Lower Limb Ischemia", as the First Contributor. Certificate Number: 2006YI-3-005-02.

6. In December 2015, CMA (Chinese Medical Science and Technology Award), First Prize for Clinical Research on Surgical Treatment of Lower Limb Ischemia in Diabetes. First

Principal Investigator. Certificate Number: 201501066P1501. Contributors: Gu Yongquan, Han Zhongchao, Wang Zhonghao, etc.

7. In December 2014, Huaxia (China) Medical Science and Technology Award, First Prize for Surgical Treatment of Multiple Arteritis. First Principal Investigator. Certificate Number: 201401036P1201. Contributors: Gu Yongquan, Han Zhongchao, Wang Zhonghao, etc.

8. In 2015, Huaxia (China) Medical Science and Technology Award, First Prize for Clinical Research on Surgical Treatment of Lower Extremity Arteriosclerotic Occlusive Disease in Diabetes. First Principal Investigator. Certificate Number: 201501039P1501. Contributors: Gu Yongquan, Han Zhongchao, Wang Zhonghao, etc.

9. In 2022, First Prize for China's Collaborative Innovation and Promotion of Industry-University-Research Cooperation, Research and Industrial Transformation of Standardized Intravascular Treatment for Lower Extremity Arterial Lesions in Diabetes. First Principal Investigator. Certificate Number: GuoKeJiangSheZhengZiDi0191. Contributors: Gu Yongquan, Ran Xingwu, Guo Lianrui, etc.

10. In 2014, Awarded the Outstanding Contribution Award by the International Union of Angiology

11. In August 2022, awarded the title of Foreign Academician of Russian Academy of Natural Sciences.

12. In 2008, awarded the Outstanding Achievement Award in China's Top Doctor Awards

**FULL PUBLICATIONS LIST:**

1. Yong QuanGu, ZhongGao Wang, Surgical treatment of cerebral ischemia caused by cervical arterial lesion due to Takayasu's Arteritis: preliminary results of 49 cases, ANZ Journal of Surgery, 2001; 71:89-92.
2. Yong-quanGu. Determination of the amputation level in ischaemic lower limbs, ANZ

- Journal of Surgery, 2004; 74:31-33.
3. Gu YQ, Zhang J, Qi LX, et al. Surgical treatment of 82 patients with diabetic lower limb ischemia by distal arterial bypass. *Chin Med J*, 2007; 120(2):106-109.
  4. Gu YQ, J Zhang, Guo LR, et al. Transplantation of autologous bone-marrow mononuclear cells for patients with lower limb ischemia. *Chin Med J*, 2008; 121(11):963-967.
  5. GuYongquan, Vascular surgery and diabetic foot revascularization. *Chinese Medical Journal*, 2010; 123(15):2116-2119
  6. GU Yong-quan, WU Ying-feng , QI Li-xing , et al. Biological artificial vessel graft in distal arterial bypass for treating diabetic lower limb ischemia :a case report .*Chinese Medical Journal* 2011 124(19):3185-3188 .
  7. GU Yong-quan, Zhang jian, Guolian-rui, et al. A phase i clinical study of naked DNA expressing two isoforms of hepatocyte growth factor to treat patients with critical limb ischemia. *J Gene Med* 2011, 13:602-610,
  8. GuYongquan, GuoLianrui, Qi Lixing, et al. Plaque excision in the management of lower-limb ischemia of atherosclerosis and in-stent restenosis with the SilverHawkatherectomy catheter, *Int Angiol.* 2013, 32(4):362-367.
  9. Qi Lixing, GuYongquan\* GuoLianrui, Li Xuefeng, Wu Yingfeng, Cui Shijun, Tong Zhu, Wu Xin, Analysis of operation-related complications of totally laparoscopic aortoiliac surgery. *Chin Med*, 2014; 127 (7):1218-1221.
  10. GuoJianming, GuoLianrui, GuYongquan\*. A case mesenchymal chondrosarcoma arising from the femoral vein with 8 years of follow-up. *Annals of Vascular Surgery*, 2015, 29(7):1455
  11. Tong Zhu, GuYongquan\*, A case series of duplicated inferior vena cava: mind the side, or fail to trap! *Int J ClinExp Med* 2015, 8(5):8029-8031.
  12. Cui Shijun, Luo Tao, GuYongquan\*, Clinical Safety and Preliminary Efficacy of Plasmid pUDK-HGF Expressing Human Hepatocyte Growth Factor (HGF) in Patients with

- Critical Limb Ischemia. *Eur J VascEndovascSurg*, 2015,1-8.
13. GuoJianming, GuoLianrui, GuYongquan\*.Effects of Sarpogrelate Combined with Aspirin in Patients Undergoing Carotid Endarterectomy in China.*Ann VascSurg*,2016,35:183-188 .
  14. GuoJianming, Guo Lianrui, GuYonquan\* .Angiojet rheolytic thromb ectomy combined catheter fragmentation in a patient with massive PE shock. *Technol Health Care*. 2017;25(1):157-161
  15. GuoLianrui, QiLixing, GuYongquan\*. Totally laparoscopic bypass surgery for aortoiliac occlusive disease in China. *Chinese Medical Journal*.126(16):3069-3072.
  16. LiXuefeng,GuYongquan\*, Successful treatment of spontaneous rupture of the internal carotid artery in an acute promyelocytic leukemia patient using ultra sound-guided thrombin in fection. *Chinese Medicaljournal*,126(2):389-390 .
  17. TongZhu,GuYongquan\*.An Analysis of Complications of Brachialand Axillary Artery Punctures".*THEAMERICANSURGEON*,2016; 82(12):1250-1256.
  18. GuYongquan, GuoLianrui, GuoJianming, Granulocyte colony-stimulating factor improves the efficacy of autologous bone marrow-derived mononuclear cell transplantation treatment for lower limb ischemia. *Intertional Angiology*, 2017 8;36(4):346-353
  19. GuoJianming,Liu Ying, GuYongquan\*, Ameliorating dyslipidemia in type 2 diabetic patients by femoropopliteal artery plaque resection under acute inflammation response. *Minerva Endocrinologica*,2017,42(4):398-400 .
  20. GuoJianming, GuYongquan\*, Meta-analysis on the treatment of diabetic foot ulcers with autologous stem cells *Stem Cell Research & Therapy* 2017, 16;8(1):228.
  21. GuYongquan\*, Qi Lixing, GuoLianrui, A comparative study of percutaneous atherectomy for femoropopliteal arterial occlusive disease *International Angiology*, 2017,36(4):340-345.



22. GuYongquan, Wang Fei,Zhang Jian\*, Preparation and evaluation of decellularized porcine carotid arteries cross-linked by genipin: The preliminary results Cell and Tissue Banking, 2017,1-11 .
23. GuoJianming, GuoLianrui, Tong Zhu, Gao Xixiang, GuYongquan\*, Angiojet rheolytic thrombectomy combined with catheter fragmentation in a patient presenting with massive pulmonary embolism and cardiogenic shock,Technology and Health Care 2017,25(1):157-161
24. Gao Xixiang,Li Liqiang,GuYongquan\*, Endovascular repair of subclavian artery aneurysms: results from a single-center experience. Perfusion, 2017,32(8):670-674.
25. GuoJianming,GuoLianrui, GuYognquan\*.Autologous bone marrow-derived mononuclear cell therapy in Chinese patients with critical limb ischemia due to thromboangiitis obliterans: 10-year results. Stem Cell Research & Therapy,2018:9(1):43-50.
26. GuoJianming,GuoLianrui, Tong Zhu, GuYongquan\*, Three-Year Clinical Results of Carotid Artery Stenting in Treating Patients with Contralateral Carotid Artery Occlusion. Journal of Stroke & Cerebrovascular Diseases,2018,27(5):1296-1301.
27. Jianming Guo, Haidi Hu, Yongquan Gu\* .Adipose-derived mesenchymal stem cells accelerate diabetic wound healing in a similar fashion as bone marrow-derived cells.AMERICAN JOURNAL OF PHYSIOLOGY-CELL PHYSIOLOGY, 2018 Dec 1;315(6):C885-C896.
28. Guo Jianming, GuYongquan\*.An infant case of renovascular hypertension in moyamoya disease treated by angioplasty. The Turkish Journal of Pediatrics, 2018,60(3):331-334.
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30. Guo Jianming,Guo Lianrui, Cui Shijun, Tong Zhu, Alan Dardik, GuYognquan\*,

- Autologous bone marrow-derived mononuclear cell therapy in Chinese patients with critical limb ischemia due to thromboangiitis obliterans: 10-year results. *Stem Cell Research & Therapy*, 2018;9(1):43-50
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  32. Gao Xixiang, GuYongquan\*, Successful Treatment of Acquired Arteriovenous Fistulas after Iliac Vein Thrombosis. *Annals of Vascular Surgery*, 2020 Jan;62:499.e15-499.e20.
  33. Gao Xixiang, GuYongquan\*, A Vascular Malformation in the Carotid Sheath at the Carotid Bifurcation Mimicking Carotid Body Tumor. *Vascular and Endovascular Surgery*, 2020 Feb;54(2):195-197.
  34. CaiZhiwen, GuYongquan\*, Decellularization, cross-linking and heparin immobilization of porcine carotid arteries for tissue engineering vascular grafts. *Cell and Tissue Banking*, 2019,20(4): 569-578.
  35. GuoJianming, GuYongquan\*, Re Alarming Results for Carotid Artery Stenting in Patients with Contralateral Carotid Artery Occlusion. *Journal of Stroke and Cerebrovascular Diseases*, 2019 28(10):104165
  36. GuYongquan, A Randomized, Double-Blind, Placebo-Controlled Phase II Study of Hepatocyte Growth Factor in the Treatment of Critical Limb Ischemia. *Molecular Therapy*, 2019,27(12): 2158-2165.
  37. Cheng Jin, Gu Yongquan\*, Combination of freeze-thaw with detergents: A promising approach to the decellularization of porcine carotid arteries. *Bio-medical materials and engineering*, 2019,30(2): 191-205.
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  39. Gao Xixiang, Gu Yongquan\*, A Vascular Malformation in the Carotid Sheath at the Carotid Bifurcation Mimicking Carotid Body Tumor. *Vascular and Endovascular*

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  42. Tong Zhu, Gu Yongquan\*,Drug-Coated Balloon Angioplasty and Debulking for the Treatment of Femoropopliteal In-Stent Restenosis: A Systematic Review and Meta-Analysis. *BioMed Research International*, 2020 ,10:2020:3076346
  43. Li Ji, Gu Yongquan\*, Characterization of a heparinized decellularized scaffold and its effects on mechanical and structural properties. *JOURNAL OF BIOMATERIALS SCIENCE-POLYMER EDITION*, 2020,31/8:999-1023.
  44. Xu Zeqin, Gu Yongquan\*, Biocompatibility evaluation of heparin-conjugated poly( $\epsilon$ -caprolactone) scaffolds in a rat subcutaneous implantation model. *JOURNAL OF MATERIALS SCIENCE-MATERIALS IN MEDICINE*, 2020 5;31(8):76
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  46. Tong Zhu, Gu Yongquan\* , Effectiveness of distal arterial bypass with porcine decellularized vascular graft for treating diabetic lower limb ischemia. *The International Journal of Artificial Organs*, 2021 Aug;44(8):580-586
  47. Guo Jianming, Guo Lianrui\*,Gu Yongquan\*. A Retrospective Comparative Study of Twelve-Month Clinical Outcomes for Drug-Coating Balloon Angioplasty and Stent Implantation in Treating Patients with Popliteal Obstructive Lesions. *Cardiovasc*

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  49. Guo Jianming, Guo Lianrui \*, Gu Yongquan\*, Analysis of 17 years of surgical treatment for chronic limb ischemia in a Chinese National Clinical Center for Geriatric Disorders (2002 to 2018). *International Journal of Cardiology*. 2020 ,1:318:39-42
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  51. Chen, Z., Y. Gu\*. Analysis of Clinical Characteristics and Prognostic Risk Factors in Patients with Stanford Type B Aortic Dissection Complicated with Hypertension. *Zhonghua Wei Zhong Bing Ji Jiu Yi Xue* 33, no. 8 (Aug 2021): 962-966.
  52. Cheng, J., Y. Gu\*. Decellularization of Porcine Carotid Arteries Using Low-Concentration Sodium Dodecyl Sulfate. *Int J Artif Organs* 44, no. 7 (Jul 2021): 497-508.
  53. Gu, Y., S. Cui, et al. Pudk-Hgf Gene Therapy to Relieve Cli Rest Pain and Ulcer: A Phase Ii, Double-Blind, Randomized Placebo-Controlled Trial.. *Hum Gene Ther* 32, no. 15-16 (Aug 2021): 839-349.
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  55. Tong, Z., Y. Gu\*. Effectiveness of Distal Arterial Bypass with Porcine Decellularized Vascular Graft for Treating Diabetic Lower Limb Ischemia. *Int J Artif Organs* 44, no. 8 (Aug 2021): 580-586.
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57. Zhou, M., L. Qi, and Y. Gu.\* Cool Excimer Laser-Assisted Angioplasty Vs. Percutaneous Transluminal Angioplasty for Infrapopliteal Arterial Occlusion: A Meta-Analysis and Systematic Review. *Front Cardiovasc Med* 8 (2021): 783358.
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  59. Mi Zhou, Lixing Qi, Yongquan Gu\*. Successful Retrieval of Dislocated Inferior Vena Cava Filter Using Double Vascular Sheaths Docking Technology: Case Report. *Thromb J* 19, no. 1 (Aug 17 2021): 56.
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  61. Guo, J., Y. Gu\*. Identification of Hub Genes and Regulatory Networks in Histologically Unstable Carotid Atherosclerotic Plaque by Bioinformatics Analysis. *BMC Med Genomics* 2022 Jun 30;15(1):145
  62. Guo, J., Y. Gu\*. The Efficacy and Safety of Different Endovascular Modalities for Infrapopliteal Arteries Lesions: A Network Meta-Analysis of Randomized Controlled Trials.. *Front Cardiovasc Med* 9 (2022): 993290.
  63. Guo, J., Y. Gu\*. Risk Factors for in-Stent Restenosis after Vertebral Artery Stenting of V1 Segment: A Systematic Review and Meta-Analysis. *Catheter Cardiovasc Interv* 100, no. 2 (Aug 2022): 279-289.
  64. Jiao, Y., Y. Gu\*. The Crescendo Pulse Frequency of Shear Stress Stimulates the Endothelialization of Bone Marrow Mesenchymal Stem Cells on the Luminal Surface of Decellularized Scaffold in the Bioreactor. *Bioengineered* 13, no. 3 (Mar 2022): 7925-7938.

65. Su, Z., and Y. Gu\*. Identification of Key Genes and Pathways Involved in Abdominal Aortic Aneurysm Initiation and Progression.. *Vascular* 30, no. 4 (Aug 2022): 639-649.
66. Su, Z., J. Guo, and Y. Gu\*. Pharmacotherapy in Clinical Trials for Abdominal Aortic Aneurysms: A Systematic Review and Meta-Analysis. *Clin Appl Thromb Hemost*, 2022 Jan Dec:28:10760296221120423.
67. doi: 10.1177/10760296221120423. Su, Z., Y. Gu\*. Biological Small-Calibre Tissue Engineered Blood Vessels Developed by Electrospinning and in-Body Tissue Architecture. *J Mater Sci Mater Med*, 2022 Sep 30;33(10):67. doi: 10.1007/s10856-022-06689-w.
68. Wei, L., Y. Gu\*. Directional Atherectomy and Drug-Coated Balloon Angioplasty Vs. Bare Nitinol Stent Angioplasty for Femoropopliteal Artery Lesions. *Vasa* 2022 Sep;51(5):275-281. doi: 10.1024/0301-1526/a001010. Epub 2022 Jul 8.
69. Pan D, Gu Y\*. Association of the controlling nutritional status score with all-cause mortality and cancer mortality risk in patients with type 2 diabetes: NHANES 1999-2018. *Diabetol Metab Syndr*. 2023 Aug 21;15(1):175. doi: 10.1186/s13098-023-01138-2. PMID: 37599357; PMCID: PMC10440932.
70. Meng W, Guo J, Pan D, Guo L, Gu Y\*. Intravascular Ultrasound-Guided Versus Angiography-Guided Endovascular Therapy for Femoropopliteal Artery Disease: A Scoping Review. *J Endovasc Ther*. 2023 Sep 9:15266028231197396.
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74. Pan D, Wang J, Gu Y\*. Impact of geriatric nutritional risk index on prognosis in peripheral artery disease patients undergoing endovascular therapy. *J Clin Hypertens (Greenwich).* 2023 May;25(5):497-503.
75. Guo J, Ning Y, Pan D, Guo L, Gu Y\*. Identification of potential hub genes and regulatory networks of smoking-related endothelial dysfunction in atherosclerosis using bioinformatics analysis. *Technol Health Care.* 2023 Nov 23. doi: 10.3233/THC-230796. Online ahead of print.
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**PATENT:**

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2. A Covered Stent, Patent Number: ZL 2016 2 0171576.9, Gu Yongquan, 2016.
3. A Covered Stent Delivery System, Patent Number: ZL 201620617941.4, Gu Yongquan, 2016.
4. A Blocked Balloon Dilation Catheter, Patent Number: ZL 201620649660.7, Gu Yongquan, 2016.
5. A Method for Removing Vascular Tissue Cells from Blood Vessel Matrix and Its Preparation, Patent Number: ZL200910076674.9, Dong Jiande, Zhang Jian, Gu Yongquan, Li Chunmin, Li Jianxin, Chen Bing, Wu Yingfeng, 2009.
6. A Long-term Indwelling Inferior Vena Cava Filter, Patent Number: ZL 2017 2 0528051.0,

Gu Yongquan, 2018.

7. A Method for Preparing a Biologically Derived Small-caliber Tissue-engineered Blood Vessel, Patent Number: ZL 2018 1 0067424.8, Gu Yongquan, Wang Cong, Cheng Jin, 2018.

8. A Long-term Indwelling Inferior Vena Cava Filter, Invention Patent, Patent Number: ZL 2017 1 0334610.9, Gu Yongquan.

9. Biodegradable Thrombus Filter and Its Preparation Method, Use and Delivery Device, Patent Number: ZL 2016 8 0090403.7, Zhao Qinghua, Cui Shujun, Shi Guixin, Zhao Qinghong, Gu Yongquan, Liu Qing, 2016.

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11. Peripheral Vascular Stent, Patent Number: ZL2021 2 1801094.4, Gu Yongquan, 2021.8.

12. A Fenestrated Covered Stent, Invention Patent, Gu Yongquan, Patent Number: ZL 2016 1 0243922.4, 2016.4.

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