Domenico Ribatti

Editor
Journal of Allergy and Therapy

Biography

Prof. Domenico Ribatti was awarded his MD degree on October 1981 with full marks. His present position is of a full-time professor of Human Anatomy at the University of Bari Medical School since 2008. In 1983 he received the degree with honors in Medicine and Pharmacy form the University of Timisoara Romania. He is a member of the Editorial Board for the Journal of Angiogenesis Research , Journal of Hematotherapy and Stem Cell Research, Drug Design Review, Online Leukemia, Open Journal of Hematology, Recent Patents on AntiCancer, Drug Discovery, Recents Patents on Cardiovascular Drug Discovery, The Open Cancer Journal, The Open Inflammation Journal, Journal of Interferon Cytokine and Mediator Research, Endothelium Romanian Journal of Morphology and Embryology, Liver Cancer Review Letters, Stem Cell Review Letters and World Journal of Stem Cells. He is also the Associated Editor of Stem Cell and Development.

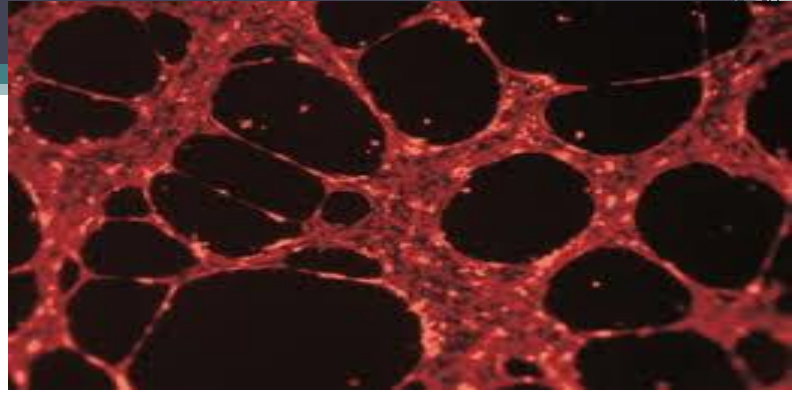
Research Interest

- Role of FGF-2 and VEGF in the vascularization of the chick embryo chorioallantoic membrane
- Angiogenesis in hematological tumors
- Angiogenesis and anti-angiogenesis in neuroblastoma
- Angiogenesis in bone tumors
- Role of mast cells in tumor angiogenesis
- Role of chemokines in angiogenesis
- Role of GM-CSF in angiogenesis
- Role of PDGF and sugars in angiogenesis
- Role of transferrin in angiogenesis
- Role of ET-1 in angiogenesis
- Role of PlGF in angiogenesis
- Role of NGF in angiogenesis
- Role of leptin an adrenomedullin in angiogenesis
- Role of esosinophils in angiogenesis
- Role of IL-12, IL-23 and IL-27 in angiogenesis
- Characterization of new anti-angiogenic molecules

Recent publications:

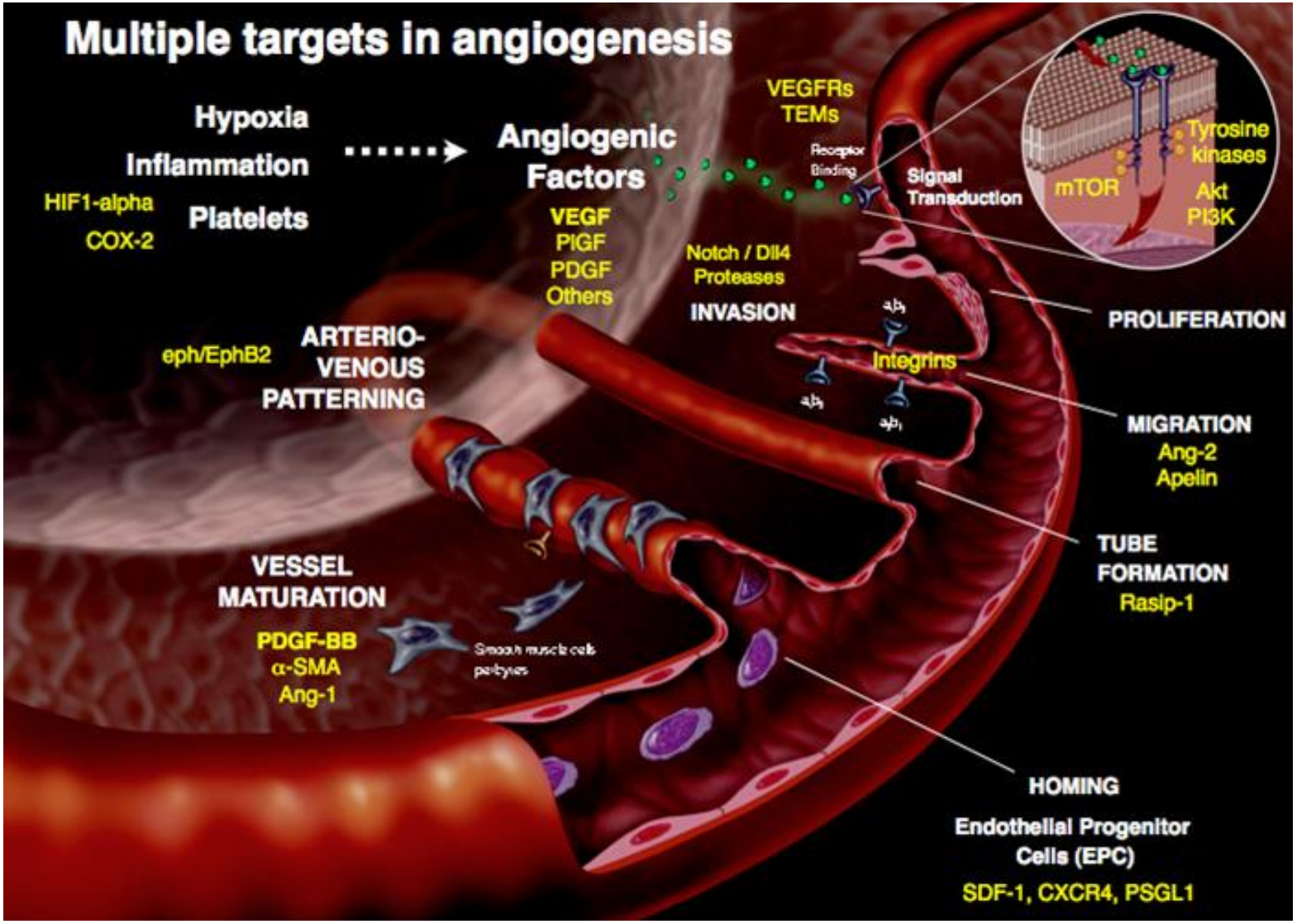
- Ribatti D, Santoiemma M (2014) Epithelial-mesenchymal interactions: a fundamental Developmental Biology mechanism. Int J Dev Biol 58: 303-306.
- Marinaccio C, Ingravallo G, Gaudio F, Perrone T, Nico B, et al. (2014) Microvascular density, CD68 and tryptase expression in human Diffuse Large B-Cell Lymphoma. Leuk Res .
- Ribatti D (2014) Max D. Cooper and the delineation of two lymphoid lineages in the adaptive immune system. Immunol Lett .
- Ferrucci A, Moschetta M1, Frassanito MA, Berardi S, Catacchio I, et al. (2014) A HGF/cMET Autocrine Loop Is Operative in Multiple Myeloma Bone Marrow Endothelial Cells and May Represent a Novel Therapeutic Target. Clin Cancer Res 20: 5796-5807.
- Martinengo C, Poggio T, Menotti M, Scalzo MS, Mastini C, et al. (2014) ALK-Dependent Control of Hypoxia-Inducible Factors Mediates Tumor Growth and Metastasis. Cancer Res 74: 6094-6106.
- Sadat U, Jaffer FA, van Zandvoort MA, Nicholls SJ, Ribatti D, et al. (2014) Inflammation and neovascularization intertwined in atherosclerosis: imaging of structural and molecular imaging targets. Circulation 130: 786-794.

Angiogenesis



- Physiological process through which new blood vessels form from pre-existing vasculature
- Involves the migration, growth, and differentiation of endothelial cells, which line the inside wall of blood vessels
- Is distinct from vasculogenesis, which is the de-novo formation of endothelial cells from mesoderm cell precursors.
- Vasculogenesis leads to the formation of the first vessels in the developing embryo, after which angiogenesis is responsible for most of the blood vessel growth during development and in disease
- Normal and vital process in growth and development, wound healing and in the formation of granulation tissue
- The body controls angiogenesis by producing a precise balance of growth and inhibitory factors in healthy tissues.

Angiogenesis signaling pathway:



- Blood vessels provide nutrients and oxygen throughout the body and are comprised of an inner lining of closely assembled endothelial cells ensheathed by pericytes, (the basement membrane) embedded in the stromal compartment
- A balance of growth factor signaling maintains endothelial cells in a quiescent, or resting state
- To monitor and supply sufficient amounts of oxygen to surrounding tissues, blood vessels have oxygen and hypoxia-induced sensors, or receptors
- They allow vessel remodeling to adjust the blood flow accordingly
- Hypoxia or other endogenous signals activate cells and induce the release signaling factors (such as VEGF, Ang-2, FGF and chemokines) to promote the growth of new blood capillaries from pre-existing vessels
- Pericytes detach from the vessel (Ang-2 signaling), and endothelial cells are activated and lose their close contact as the vessel dilates (VE-cadherin signaling).

- In sprout formation, a tip cell is selected (selection influenced by Neuropilin, VEGF/VEGFR and NOTCH / DLL4 and JAGGED1 signaling) which releases matrix metalloproteases (MT1-MMP) to degrade the basement membrane and remodel the extracellular matrix
- Tip cells are polarized and extend numerous filopodia to guide sprout migration (via semaphorins, ephrins, and integrins guidance signals) toward angiogenic stimuli (VEGF gradient). Tip cells are primarily migratory and do not proliferate.
- Stalk cells follow the tip cell and proliferate, extending the sprout. Proliferating stalk cells establish junctions with neighboring endothelial cells and release molecules such as EGFL7 (an endothelial cell chemoattractant expressed by proliferating endothelial cells) that bind to extracellular membrane components and regulates vascular lumen formation.
- Fusion of neighboring branches occurs when 2 tip cells encounter each other, establish EC-EC junctions (VE-cadherin, Ang-1) and form a continuous lumen. Extracellular matrix is deposited to establish a new basement membrane (TIMPs), endothelial cell proliferation ceases, and pericytes are recruited to stabilize the new vessel (PDGFR/PDGF-B, Ang-1)
- Once blood flow is established, the perfusion of oxygen and nutrient reduces angiogenic stimuli (VEGF expression) and inactivates endothelial cell oxygen sensors, re-establishing the quiescent state of the blood vessel.

Angiogenic Growth Factors

The lists below include some of the factors that have been shown to modulate angiogenesis:

1. Angiogenin
2. Angiopoietin-1
3. Del-1
4. Fibroblast growth factors
5. Granulocyte colony-stimulating factor (G-CSF)
6. Hepatocyte growth factor (HGF) /scatter factor (SF)
7. Interleukin-8 (IL-8)
8. Leptin
9. Midkine
10. Placental growth factor
11. Platelet-derived endothelial cell growth factor (PD-ECGF)
12. Platelet-derived growth factor-BB (PDGF-BB)
13. Pleiotrophin (PTN)
14. Progranulin
15. Proliferin
16. Transforming growth factor-alpha (TGF-alpha)
17. Transforming growth factor-beta (TGF-beta)
18. Tumor necrosis factor-alpha (TNF-alpha)
19. Vascular endothelial growth factor (VEGF)/vascular permeability factor (VPF)

Angiogenesis Inhibitors

1. Angioarrestin
2. Angiostatin
3. Antiangiogenic antithrombin III
4. Arrestin
5. Chondromodulin
6. Canstatin
7. Cartilage-derived inhibitor (CDI)
8. CD59 complement fragment
9. Endostatin
10. Endorepellin
11. Fibronectin fragment
12. Anastellin
13. Gro-beta
14. Heparinases
15. PEX
16. Heparin hexasaccharide fragment
17. Human chorionic gonadotropin (hCG)
18. Interferon alphagamma Interferon inducible protein (IP-10)
19. Interleukin-12
20. Kringle 5 (plasminogen fragment)
21. Metalloproteinase inhibitors (TIMPs)
22. 2-Methoxyestradiol
23. Tumstatin
24. Pigment epithelium derived factor (PEDF)
25. Placental ribonuclease inhibitor
26. Plasminogen activator inhibitor
26. Platelet factor-4 (PF4)
27. Prolactin 16kD fragment
28. Proliferin-related protein (PRP)
29. Prothrombin kringle 2
30. Retinoids
31. Soluble Fms-like tyrosine kinase-1 (S-Flt-1)
32. Targeting fibronectin-binding integrins
33. Tetrahydrocortisol-S

Thrombospondin-1 (TSP-1) and -2

34. Transforming growth factor-beta (TGF-b)
35. Troponin I
37. Vasculostatin
38. Vasostatin

Importance of Angiogenesis in cancer

- Angiogenesis: critical role in the growth and spread of cancer.
- Blood supply is necessary for tumors to grow
- Tumors can cause this blood supply to form through chemical signals that stimulate angiogenesis
- They can also stimulate nearby normal cells to produce angiogenesis signaling molecules
- New blood vessels “feed” growing tumors with oxygen and nutrients, allowing the cancer cells to invade nearby tissue, to move throughout the body, and to form new colonies of cancer cells, called metastases
- Tumors cannot grow beyond a certain size or spread without a blood supply,
- Scientists are, thus, trying to find ways to block tumor angiogenesis
- Natural and synthetic angiogenesis inhibitors are being studied with the idea that these molecules will prevent or slow the growth of cancer.

Application in medicine

1. Angiogenesis as a therapeutic target

- Angiogenesis may be a target for combating diseases characterized by either poor vascularisation or abnormal vasculature
- Application of specific compounds that may inhibit or induce the creation of new blood vessels in the body may help combat such diseases
- The presence of blood vessels where there should be none may affect the mechanical properties of a tissue, increasing the likelihood of failure
- The absence of blood vessels in a repairing or otherwise metabolically active tissue may inhibit repair or other essential functions

2. Tumor angiogenesis

- Cancer cells loose their ability to divide in a controlled fashion.
- A tumor is a population of rapidly dividing and growing cancer cells that progressively leads to mutations
- They require a dedicated blood supply to provide the oxygen and other essential nutrients to grow beyond a certain size
- Tumors induce blood vessel growth by secreting various growth factors
- Growth factors such asbFGF and VEGF can induce capillary growth into the tumor, which allows tumor expansion.
- Tumor blood vessels are dilated with an irregular shape.

3. Formation of tumor blood vessels

- New blood vessel formation is a relatively fragile process
- The therapy involves the selection agent which is being used to kill a cell compartment.
- Tumor cells evolve resistance rapidly due to rapid generation time and genomic instability, whereas endothelial cells are a good target because of a long generation time and genomic stability
- Using a selection pressure to target and differentiate between varying populations of cells
- End result is the extinction of one species or population of cells followed by the collapse of the ecosystem due to either nutrient deprivation or self-pollution
- Angiogenesis-based tumor therapy relies on natural and synthetic angiogenesis inhibitors like angiostatin, endostatin and tumstatin

4. Exercise

- Angiogenesis-generally associated with aerobic exercise and endurance exercise
- Arteriogenesis produces network changes that allow for a large increase in the amount of total flow in a network
- Angiogenesis causes changes that allow for greater nutrient delivery over a long period of time
- Capillaries provide maximum nutrient delivery efficiency, so an increase in the number of capillaries allows the network to deliver more nutrients in the same amount of time
- Greater number of capillaries allows for greater oxygen exchange in the network
- Important to endurance training, because it allows a person to continue training for an extended period of time

5. Macular degeneration

- Overexpression of VEGF causes increased permeability in blood vessels in addition to stimulating angiogenesis.
- Wet macular degeneration: VEGF causes proliferation of capillaries into the retina
- As increase in angiogenesis also causes edema, blood and other retinal fluids leak into the retina, causing loss of vision
- Anti-angiogenic drugs targeting the VEGF pathways are now used successfully to treat this type of macular degeneration

Allergy and Therapy Related Journals

- Cell biology: Research & Therapy
- Immunological Techniques in Infectious Diseases
- Immunome Research

Allergy & Therapy
Related Conferences

- 4th International Conference and Exhibition on Immunology"

OMICS Group **Open Access Membership**

OMICS publishing Group Open Access Membership enables academic and research institutions, funders and corporations to actively encourage open access in scholarly communication and the dissemination of research published by their authors.

For more details and benefits, click on the link below:

http://omicsonline.org/membership.php

OMICS GROUP

OMICS Group International through its Open Access Initiative is committed to make genuine and reliable contributions to the scientific community. OMICS Group hosts over **400** leading-edge peer reviewed Open Access Journals and organizes over **300** International Conferences annually all over the world. OMICS Publishing Group journals have over **3 million** readers and the fame and success of the same can be attributed to the strong editorial board which contains over **30000** eminent personalities that ensure a rapid, quality and quick review process. OMICS Group signed an agreement with more than **1000** International Societies to make healthcare information Open Access.

OMICS Journals are welcoming Submissions

OMICS Group welcomes submissions that are original and technically so as to serve both the developing world and developed countries in the best possible way.

OMICS Journals are poised in excellence by publishing high quality research. OMICS Group follows an Editorial Manager® System peer review process and boasts of a strong and active editorial board.

Editors and reviewers are experts in their field and provide anonymous, unbiased and detailed reviews of all submissions.

The journal gives the options of multiple language translations for all the articles and all archived articles are available in HTML, XML, PDF and audio formats. Also, all the published articles are archived in repositories and indexing services like DOAJ, CAS, Google Scholar, Scientific Commons, Index Copernicus, EBSCO, HINARI and GALE.

For more details please visit our website:
http://omicsonline.org/Submitmanuscript.php