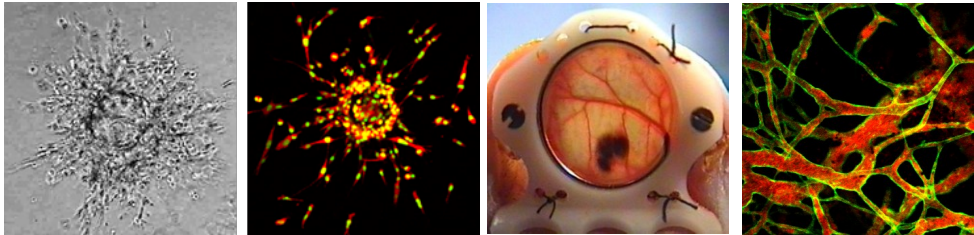


PhD Project Description

School/Department:	Department of Pathology Erasmus MC
Supervisor information:	<ul style="list-style-type: none"> • Prof dr Adriaan B. Houtsmuller Assoc. Prof dr Timo L.M. ten Hagen • Email: a.houtsmuller@erasmusmc.nl t.l.m.tenhagen@erasmusmc.nl • Website: www.erasmusmc.nl , www.molmed.nl • Grants: NIH, EU FP6, EU FP7, CSC, Mrace, NWO, BBOL, DdHSt • Most important publications: <ol style="list-style-type: none"> 1) ...ten Hagen TLM, Smits R, Bruno MJ, Fuhler GM, Peppelenbosch MP. Carcinogenesis. 2019 Feb 20 2) ...ten Hagen TLM. Sci Rep. 2018 Jun 25;8(1):9596. 3) ...ten Hagen TLM, ..., Peppelenbosch MP, Fuhler GM. Oncotarget. 2016 8;7(45):73525-40. 4) ...ten Hagen TLM, Fuhler GM. Oncotarget. 2016 Apr 19;7(16):21922-38. 5) ...ten Hagen TLM Nat Protoc. 2015 Jun;10(6):904-15. 6) ...ten Hagen TL. Eur J Cancer. 2016 Jan;53:135-43. 7) ...Houtsmuller AB. Sci Rep. 2019 Jul 18;9(1):10460. 8) ...Houtsmuller AB, van den Dries K, Wiseman PW, Cambi A. Nat Commun. 2016 7:13127. 9) ...Houtsmuller A, Huveneers S, de Rooij J. Sci Rep. 2015 5:17225. 10) ...Houtsmuller AB, van de Water B. J Cell Sci. 2012 125(Pt 19):4498-506.
Project Title:	<i>Understanding local and systemic progression of cancer with respect to tumor – stroma interaction and metastasis development.</i>
Abstract:	<p>Local development of cancer is not only interesting for development of therapeutics or understand what drives tumor progression. Importantly, aspects of local development connect with the occurrence of metastasis, progression of the disease and eventually mortality. For instance, while tumor cell proliferate and a larger mass is formed the surrounding tissue, tumor stroma, needs to be recruited. The environment (may) provide stimulatory signals, inflammatory cells promote growth, specific immune cells inhibit antitumor responses, nutrients and oxygen are delivered through a (newly) developed vascular bed. These all will help the tumor to progress locally. However, these factors as well affect progression beyond the primary tumor. Vasculature and lymphatics help metastasis by providing the logistics for spreading cells, inflammation may help cells to escape through opening tissues and endothelial lining, and locally produced factors may have an effect at distance, either by inhibiting or promoting growth of new tumors, or by creating a favorable niche at distance for circulating tumor cells to locate. It is clear that expansion of a tumor is not just a stochastic effect but that certain tumor cells are responsible for the onset of growth, which some would call tumor stem cells, and that expansion may involve a different set of tumor cells resulting from the stem cells. More so, when tumors evolve locally clonal growth may occur, but clearly differentiation of tumor cells takes place. For instance, it is proposed that cells go through transitions such as the EMT (epithelial-to-mesenchymal transition), where proliferation is tuned down and migratory capacity goes up when a cell is destined to metastasis. When at location this process is reversed; the tumor cells loses the migratory capacity while gaining again in proliferative capacity. However, we have examples where this is not a given; tumor cells exhibit high proliferation as well as migration capacities at the same time. Here we study the aspects of tumor progression as disease in a number of in vitro and in vivo models including, but not limited to, intravital microscopy, advanced 3D live cell imaging, spheroid cultures, clonal expansion, and vascular formation. Below 3D growth and dispersion in vitro (left two images) and intravital window with image of green vessels and red blood marker (right two images)</p> <div>  </div>
Requirements of candidate:	<ul style="list-style-type: none"> • We are looking for a highly motivated, hardworking student to join our very international team. Our strength is in using team work to tackle large scientific questions and thus requires a student with good communication skills. • Master degree or MD • Scholarship that will, at least, cover subsistence allowance and international air plane ticket (we could help with the scientific part of your scholarship proposal) • English language requirement:

Erasmus MC, ranked world no. 32 for [Clinical Medicine US News 2020](#) no. 30 [Nature Index for Biomedical Sciences 2019](#)

PhD Project Description

	<i>English speaking countries & Netherlands: no requirement</i> <i>Other countries: IELTS 7.0 (min 6.0 for all subs), TOEFL 100 (min 20 for all subs)</i>
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Application requirements & Deadlines:

<https://www.eur.nl/en/about-eur/erasmus-university-china-centre/csc-scholarship>

Erasmus MC, ranked world

** No.32 for Clinical Medicine US News 2020:*

<https://www.usnews.com/education/best-global-universities/clinical-medicine?page=3>

** No. 30 Nature Index for Biomedical Sciences 2019:*

<https://www.natureindex.com/supplements/nature-index-2019-biomedical-sciences/tables/healthcare>