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## **Clinical application of biomarkers in colon cancer : studies on apoptosis, proliferation and the immune system**

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## List of publications

**DNA methylation of apoptosis genes in rectal cancer predicts patient survival an tumor recurrence.** E. Zeestraten, A. Benard, I. Goossens-Beumers, H. Putter, C. van de Velde, D. Hoon, P. Kuppen. Accepted in Apoptosis

**Clinical prognostic value of combined analysis of Aldh1, Survivin and EpCAM expression in colorectal cancer.** I. Goossens-Beumer, E. Zeestraten, A. Benard, T. Christen, M. Reimers, R. Keijzer, C. Sier, GJ Liefers, H. Morreau, H. Putter, A. Vahrmeijer, C. van de Velde, P. Kuppen. Br. J. Cancer. 2014; 110 (12): 2935-44

**Combined analysis of HLA Class I, HLA-E and HLA-G predicts prognosis in colon cancer patients.** E. Zeestraten, M. Reimers, S. Saadatmand, J. Dekker, G. Liefers, C. van de Velde, P. Kuppen. Br. J. Cancer. 2014; 10(2): 459-68

**The homeobox gene MEIS1 is methylated in BRAFV600E mutated colon tumors.** A. Diha, A. Boot, E. van Roon, M.Schrumpf, A. Farina-Sarasqueta, M. Fiocco, E. Zeestraten, P. Kuppen, H. Morreau, T. van Wezel, J. Boer. Plos One. 2013; 8 (11)

**Biomarkers and precision medicine in CRC.** M. Reimers, E. Zeestraten, P. Kuppen, G. Liefers, C. van de Velde. Gastroenterology Rep. 2013; 1(3): 166-83

231

**The prognostic value of the apoptosis pathway in colorectal cancer; a review of the literature on biomarkers identified by immunohistochemistry.** E. Zeestraten, A. Benard , M. Reimers, P. Schouten, G. Liefers, C. van de Velde , P. Kuppen. Biomarkers in Cancer. 2013; 5: 13-29

**Independent validation of a prognostic genomic signature (ColoPrint) for patients with stage II colon cancer.** M. Maak, I. Simon, U. Nitsche, P. Roepman, M. Snel, A. Glas, T. Schuster, G. Keller, E. Zeestraten, I. Goossens, KP. Janssen, H. Friess, R. Rosenberg. Ann. Surg. 2013; 257 (6):1053-8

**The proportion of tumor-stroma as a strong prognosticator for stage II and III colon cancer patients: validation in the VICTOR trial.** A. Huijbers, R. Tollenaar, G.v Pelt, E. Zeestraten, S. Dutton, C. McConkey, E. Domingo, V. Smit, R. Midgley, B. Warren, E. Johnstone, D. Kerr, W. Mesker. Ann. Oncol. 2013; 24(1): 179-85

**Addition of interferon- $\alpha$  to the p53-SLP<sup>®</sup> vaccine results in increased production of interferon- $\gamma$  in vaccinated colorectal cancer patients: a phase I/II clinical trial.** E. Zeestraten, F. Speetjens, M. Welters, S. Saadatmand, L. Stynenbosch, R. Jongen, E. Kapiteijn, H. Gelderblom, H. Nijman, A. Valentijn, J. Oostendorp, L. Fathers, J. Drijfhout, C. van de Velde, P. Kuppen, S. van der Burg, C. Melief. Int. J. Cancer. 2012; 132(7): 1581-91

**Specific activity of cyclin-dependent kinase I is a new potential predictor of tumour recurrence in stage II colon cancer.** E. Zeestraten, M. Maak, M. Shibayama, T. Schuster, U. Nitsche, T. Matsushima, S. Nakayama, K. Gohda, H. Friess, C. van de Velde, H. Ishihara, R. Rosenberg, P. Kuppen, KP. Janssen. *Br. J. Cancer*. 2012; 106: 133-140

**FoxP3- and CD8-positive Infiltrating Immune Cells Together Determine Clinical Outcome in Colorectal Cancer.** E. Zeestraten, A. van Hoesel, F. Speetjens, A. Menon, H. Putter, C. van de Velde, P. Kuppen. *Cancer Microenviron*. 2012; 6(1): 31-9

**Prediction in rectal cancer.** E. Zeestraten, P. Kuppen, C. van de Velde, C. Marijnen. *Semin. Radiat. Oncol*. 2012; 22(2): 175-83

**Transanal endoscopic microsurgery for T1 rectal cancer: size matters!** P. Doornebosch, E. Zeestraten, E. de Graaf, P. Hermsen, I. Dawson, R. Tollenaar, H. Morreau. *Surg. Endosc*. 2012; 26(2): 551-7

**PIK3CA kinase domain mutation identifies a subgroup of stage III colon cancer patients with poor prognosis.** A. Fariña Sarasqueta, E. Zeestraten, T. van Wezel, G. van Lijnschoten, R. van Eijk, J. Dekker, P. Kuppen, I. Goossens-Beumer, V. Lemmens, C. van de Velde, H. Rutten, H. Morreau, A. van den Brule. *Cell. Oncol*. 2011; 34(6): 523-31

**Colorectal cancer vaccines in clinical trials.** F. Speetjens, E. Zeestraten, P. Kuppen, C. Melief, S. van der Burg, *Expert. Rev. Vaccines*. 2011; 10(6): 899-921

**PIK3CA mutations predict local recurrences in rectal cancer patients.** Y. He, L. Van't Veer, I. Mikolajewska-Hanclich, M. van Velthuysen, E. Zeestraten, I. Nagtegaal, C. van de Velde, C. Marijnen. *Clin. Cancer Res*. 2009; 15(22): 6956-62

**Clinical impact of HLA class I expression in rectal cancer.** F. Speetjens, E. de Bruin, H. Morreau, E. Zeestraten, H. Putter, J. van Krieken, M. van Buren, M. van Velzen, N. Dekker-Ensink, C. van de Velde, P. Kuppen. *Cancer Immunol. Immunother*. 2008; 57(5): 601-9

**Pediatric outcome in Rhesus hemolytic disease treated with and without intrauterine transfusion.** I. De Boer, E. Zeestraten, E. Lopriore, I. van Kamp, H. Kanhai, F. Walther. *Am. J. Obstet. Gynecol*. 2008; 198(1):54e1-4

## SUBMITTED

**Combined markers of tumor cell proliferation and apoptosis are clinically prognostic in stage II colon cancer patients.** E. Zeestraten, G. van Pelt, I. Goossens-Beumer, U. Nitsche, M. Maak, R. Rosenberg, K.P. Janssen, G. Liefers, C. van de Velde, P. Kuppen. Submitted for publication

**Nuclear expression of histone deacetylases and their histone modifications predicts clinical outcome in colorectal cancer.** A. Benard, I. Goossens-Beumer, A. van Hoesel, H. Horati, W. de Graaf, H. Putter, E. Zeestraten, GJ Liefers, C. van de Velde, P. Kuppen. Submitted for publication

**Polycomb proteins EZH2, BMI1 and SUZ12 and histone modification H3K27me3 predict clinical outcome in colorectal cancer.** A. Benard, I. Goossens-Beumer, A. van Hoesel, H. Horati, H. Putter, E. Zeestraten, C. van de Velde, P. Kuppen. Submitted for publication

**Histone methylation at H3K4, H3K9 and H4K20 predicts patient survival and tumor recurrence in early stage colon cancer.** A. Benard, I. Goossens-Beumer, A. van Hoesel, W. de Graaf, H. Horati, H. Putter, E. Zeestraten, C. van de Velde, P. Kuppen. Submitted for publication

**Age-dependent clinical prognostic value of histone modifications in colorectal cancer.** I. Goossens-Beumer, A. Benard, E. Zeestraten, H. Putter, S. Bohringer, GJ. Liefers, C. van de Velde, P. Kuppen. Submitted for publication

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234

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## Curriculum vitae

Eliane Cornelia Maria Zeestraten was born on May 17th 1983 in Heerlen, the Netherlands. After graduating cum laude from the Gymnasium of the Bernardinus College in Heerlen in 2001, she started studying medicine that same year at the University of Leiden, the Netherlands. During her medical training she performed two research projects. The first one entitled; 'Pediatric outcome in Rhesus hemolytic disease treated with and without intrauterine transfusion' at the department of Neonatology in the LUMC in Leiden under the supervision of Dr. I. de Boer and Prof. Dr. F.J. Walther. The second one; 'Clinical impact of HLA class I expression in rectal cancer', at the department of Surgery in the LUMC under the supervision of Dr. P.J.K. Kuppen and Prof. Dr. C.J.H van de Velde. After graduating in 2007 she commenced with her medical rotations, obtaining her medical degree on September 27<sup>th</sup> 2009. Because of her great interest in academic research as well as the surgical profession, she choose to work on a PhD project at the Surgical Oncology research group of the department of Surgery in the LUMC. This PhD project that resulted in the current thesis was performed under supervision of Prof. Dr. C.J.H van de Velde and the co-supervisors Dr. P.J.K Kuppen and Dr. G.J. Liefers. During this four year period she spend 9 months at the Department of Molecular Oncology of the John Wayne Cancer Institute at Saint John's Health Center in Santa Monica, California, USA under the supervision of Dr. D.S.B. Hoon, performing additional studies on the clinical relevance of methylation profiles of apoptotic genes in rectal cancer. The results will be published in Apoptosis in the near future.

235

After the four years she spent working on her PhD project she began her clinical training as a surgical resident (not in training) at the Groene Hart Hospital in Gouda, the Netherlands (head: Dr. R.F. Schmitz). In July 2012 she started her general surgical training at the Erasmus MC in Rotterdam, the Netherlands. (supervisor; Dr. B.P.L Wijnhoven) Currently, she is working as a surgical resident in training at the IJsselland hospital in Capelle a/d IJssel, the Netherlands. ( supervisor; Dr. I. Dawson)

