



Universiteit  
Leiden  
The Netherlands

## Short term fasting, IGF/insulin-axis and therapy outcome in patients with cancer

Groot, S. de

### Citation

Groot, S. de. (2021, September 1). *Short term fasting, IGF/insulin-axis and therapy outcome in patients with cancer*. Retrieved from <https://hdl.handle.net/1887/3206649>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3206649>

**Note:** To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/3206649> holds various files of this Leiden University dissertation.

**Author:** Groot, S. de

**Title:** Short term fasting, IGF/insulin-axis and therapy outcome in patients with cancer

**Issue date:** 2021-09-01



# **Short term fasting, IGF/insulin-axis and therapy outcome in patients with cancer**

S. de Groot

© Copyright 2021, S. de Groot

Print: ProefschriftMaken.nl

Layout: Dennis Hendriks || ProefschriftMaken.nl

Cover: Estay Concept & Design || [www.estay.nl](http://www.estay.nl)

Financial support by MMV, Uitgeverij Jaap, Nationaal Fonds tegen Kanker, Servier Nederland Farma and ChipSoft for the publication of this thesis is gratefully acknowledged.

# **Short term fasting, IGF/insulin-axis and therapy outcome in patients with cancer**

Proefschrift

ter verkrijging van  
de graad van doctor aan de Universiteit Leiden,  
op gezag van rector magnificus prof.dr.ir. H. Bijl,  
volgens besluit van het college voor promoties  
te verdedigen op woensdag 1 september 2021  
klokke 13.45 uur

door

Stefanie de Groot  
geboren te Rotterdam  
in 1985

**Promotores**

Prof. Dr. H. Pijl

Prof. Dr. Ir. J.J.M. van der Hoeven

**Co-promotor**

Dr. J. R. Kroep

**Leden promotie commissie**

Prof. Dr. A.J. Gerderblom

Prof. Dr. E. van der Wall (UMC Utrecht)

Prof. Dr. Ir. E. Kampman (Wageningen universiteit)

## Contents

Chapter 1	General introduction	7
<b>Part I</b>	<b>Short-term fasting and fasting mimicking diets as an adjunct to chemotherapy</b>	
Chapter 2	Effects of short-term fasting on cancer treatment	17
Chapter 3	The effects of short-term fasting on tolerance to (neo) adjuvant chemotherapy in breast cancer patients	45
Chapter 4	Fasting mimicking diet as an adjunct to neoadjuvant chemotherapy for breast cancer	67
<b>Part II</b>	<b>IGF-1 and insulin pathway in cancer treatment</b>	
Chapter 5	Inhibition of the IGF/insulin-axis in Ewing sarcoma and breast cancer	95
Chapter 6	IGF-1R as a predictive marker for chemotherapy efficacy in breast cancer patients	121
Chapter 7	IGF-1R and insulin to predict survival in breast cancer patients treated with chemotherapy	143
Chapter 8	IGF-1 and survival in Ewing sarcoma patients treated with chemotherapy	159
Chapter 9	General discussion and future perspectives	175
Chapter 10	Summary and appendices	
	Nederlandse samenvatting	189
	List of publications	191
	List of co-auteurs	193
	Curriculum Vitae	194
	Dankwoord	195