





- **Extrusion/ Spheronization**
- **Continuous Granulation by Roll Compaction/Dry Granulation**
- **Continuous Granulation by Twin-Screw Granulation**
- **Solid Lipid Extrusion**
- **Tableting**
- **Coating Processes**
- **Melt Extrusion**



- **Paediatric formulations**
  - Minitablets
  - Orodispersible Tablets
  - Film formulations
  - Ion-exchange resonates
  - Devices for individual dosing
  - Pulmonary drugs and devices
- **Orphan drugs**
- **Taste assessment and masking**
- **Process analytical technologies**



- **Biodegradable Macromers**
- **Bioactive Hydrogels**
- **Bioprinting**



- **3D Printing in Pharmaceuticals**
  - **FDM printing**
    - Filament extrusion for fused deposition modelling
    - Development of a one-step extrusion-printing technique
    - Drug printing for individual dosing
  - **Rapid prototyping**
  - **Powder printing**
- **Poorly soluble drugs**
    - Child appropriate formulations of poorly soluble drugs
    - Biopharmaceutical characterization of amorphous solid dispersion

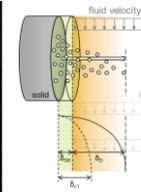
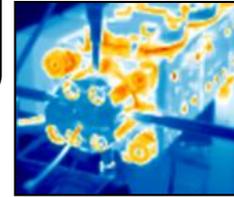
# Organizational structure

	TU Dortmund University	Faculty Bio- and Chemical Engineering
<b>Founded in</b>	1968	1969
<b>Area</b>	172.000 m <sup>2</sup>	15.000 m <sup>2</sup>
<b>Students</b>	~33.000	~1200
<b>Staff</b>	6.200	188
<b>Professors</b>	300	13
<b>Faculties/ Laboratories</b>	16	13 (5 in pharmaceuticals)





**Head of chair**  
*Prof. Dr. M. Thommes*



Working groups

**Spray and dispersing processes**  
*Dipl.-Chem. G. Schaldach*

**Particle separation from gases**  
*Prof. Dr.-Ing. D. Pieloth*

**Extrusion**  
*Dr.-Ing. J. Winck*

**Granulation and milling**  
*Dr.-Ing. J. Bartsch*

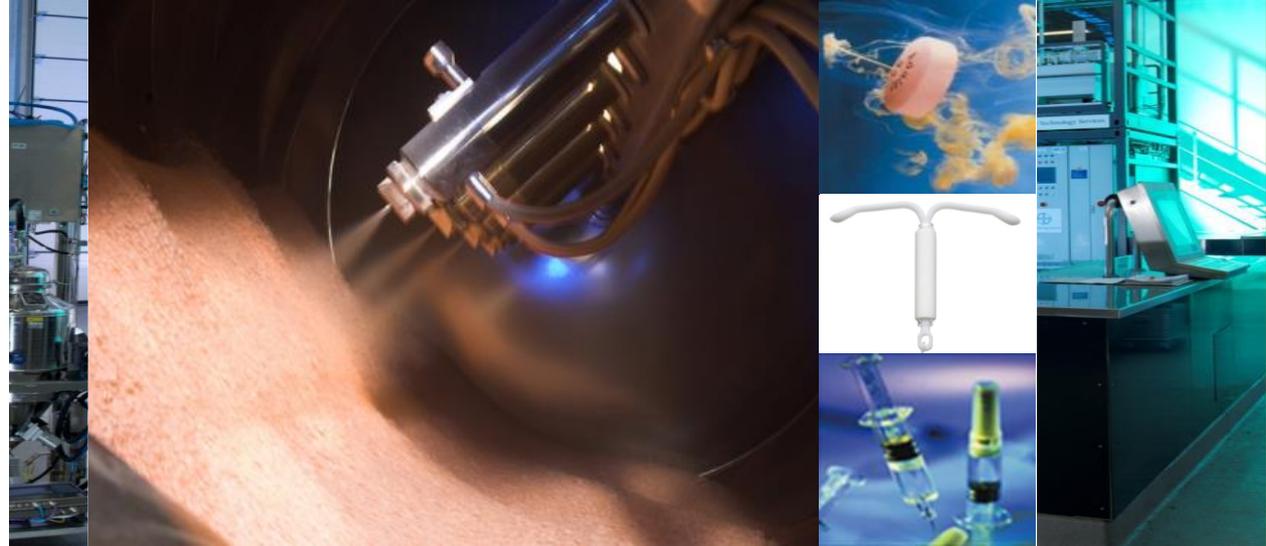
Projects

- production of SCS via spray drying
- production of sub-micron particles via spray drying
- continuous tablet coating

- performance improvement of fibrous filters
- production of sub-micron particles via precipitation

- hot-melt-extrusion
- comparing manufacturing techniques for ASDs
- molecular phenomena in polymeric systems

- continuous melt milling
- modelling of the drug dissolution behaviour
- direct compression
- modelling of FBG



**invite.**  
■ innovations ■ innovations  
■ visions ■ visions  
■ technologie ■ technologies

**DDiC**  
Drug Delivery **innovation** Center

Started September 1, 2017

[ddic.invite-research.com](http://ddic.invite-research.com)

*demonstrating future production concepts*

## Academic Partners

HHU Düsseldorf: Prof. Dr. J. Breitzkreutz  
Prof. Dr. Dr. h.c. P. Kleinebudde

TU Dortmund: Prof. Dr. G. Schembecker  
Prof. Dr. G. Sadowski  
Prof. Dr. M. Thommes

EMAU Greifswald: Prof. Dr. W. Weitschies\*

LMU München: Prof. Dr. G. Winter\*

\* external academic partners

## Industry Partners

TIER-1:	Bayer	TIER-2:	Ashland	Haver & Boecker
	Merck		Inosim	L.B. Bohle
	UCB		Parsum	Amofor
			Siemens	Nisso Chemical Europe

12 Ph.D. students were employed since September 2017  
Also a number of Postdocs were hired!

# National Funding Opportunities – PhD students

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- **DAAD (German Academic Exchange Service)**
  - Full PhD programme in Germany
  - Bi-nationally Supervised Doctoral Degrees
  - One-Year and Short-Term Grants

- **DFG (German Research Foundation)**

  - Walter-Benjamin-Programme

    - You are in Germany and want to go abroad
    - Postdocs in early career phase
    - Applicants must have worked in Germany for the last three years

- **Humboldt-Foundation**

  - Humboldt Research Fellowship

    - You are in outside of Germany and want come to Germany
    - Postdocs in early career phase
    - Additional support in Germany: e.g. intensive language course

- **DAAD (German Academic Exchange Service)**

    - Bilateral Exchange of Academics (short term visits: up to 3 months)

- **DFG (German Research Foundation)**

Walter-Benjamin-Programme

[https://www.dfg.de/en/research\\_funding/programmes/individual/walter\\_benjamin/index.html](https://www.dfg.de/en/research_funding/programmes/individual/walter_benjamin/index.html)

- **Humboldt-Foundation**

Humboldt Research Fellowship

(<https://www.humboldt-foundation.de/en/apply/sponsorship-programmes/humboldt-research-fellowship>)

- **DAAD (German Academic Exchange Service)**

Full PhD programme in Germany

(<http://www.research-in-germany.org/en/research-funding/funding-programmes/daad-research-grants-doctoral-programmes-in-germany.html>)

Bi-nationally Supervised Doctoral Degrees

(<http://www.research-in-germany.org/en/research-funding/funding-programmes/daad-research-grants-bi-nationally-supervised-doctoral-degrees.html>)

One-Year and Short-Term Grants

(<http://www.research-in-germany.org/en/research-funding/funding-programmes/daad-research-grants---one-year-and-short-term-grants.html>)

Great:

Visit <http://www.research-in-germany.org/en> for an excellent overview of all programmes!

Also great:

Marie Skłodowska-Curie European Postdoctoral Fellowships (EU funded)