# Start of the SerMa – EUBREAST 5 (Seroma of the Mammary Gland) study (NCT05899387)

**N. Ditsch**[1], M.B. Köpke[1], N. Pochert[2], U. Jeschke[1], M. Schneider[1], M. Reiger[2], C. Traidl-Hoffmann[2], Y. Masannat[3], A. Mattmer[1], S. Hunstiger[1], J. Sagasser[1], C. Dannecker[1], M. Wild[1], C. Hinske[4], M. Hauptmann[5], S. Hartmann[6], H. Kahl[7], D. Krug[8], N. Krawczyk[9], K. Stemmer[10], D. Rezek[11], A. Raue[12], M. Gasparri[13], R. Reitsamer[14], J. Jelinska[15], G. Cakmak[16], E. Bonci[17], R. Wuerstlein[18], V. Fink[19], V. Bjelic-Radisic[20], M. Thill[21], C. Heitmann[22], W. Weber[23], E. Stickeler[24], A. Lebeau[25], P. A. Fasching[26], H.-C. Kolberg[27], T. Reimer[6], L. Bauer[28], U. Beckmann[29], B. Aktas[30], S. Hasmueller[31], U. Schlembach[32], R. Di Micco[33], J. de Boniface[34], O. Gentilini[33], M. Untch[35], T. Kühn[36], M. Banys-Paluchowski[37]

## Background

The standard local therapy for breast cancer is surgery. **Postoperative seroma formation** is one of the most common and **serious complications after breast surgery** for primary breast cancer, especially in patients undergoing **mastectomy with or without implant-based breast reconstruction**. Seromas may lead to infections and wound dehiscence, which can **result in loss of reconstruction and poor cosmetic outcome**. To date, the **cause of seroma development** has **not yet been clarified.**

## Trial Design

The main objective of the **multicenter, minimal interventional SerMa study** is to **identify patients with an increased risk of developing seromas** based on **immunological or inflammatory markers** in blood and seroma fluid in a planned cohort of 2200 subjects. The study is designed as **international, prospective cohort study** in cooperation with the **EUBREAST Network** (European Breast Cancer Research Association of Surgical Trialists). Participating study groups are AGO-B, AWOgyn and OPBC. Patients with **primary breast cancer or ductal carcinoma in situ (DCIS)** planned for mastectomy with or without reconstruction can participate in this study (study group 1 and 2), a neoadjuvant treatment is possible. Study group 3 includes **patients at high risk for breast cancer** planned for **risk-reducing skin-sparing mastectomy and implant-based reconstruction**. Study group 4 includes **healthy women with implant insertion exclusively for cosmetic reasons**. Currently, **the logistics phase with 50 patients has been completed**, which was carried out to optimize the preservation of blood samples and seroma fluid.

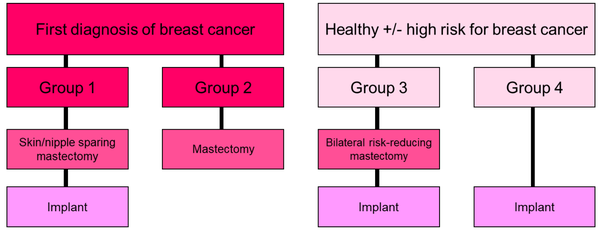


**Figure 1.** Overview of the four study groups

**Table 1.** Inclusion and exclusion criteria

| Study Group 1 and 2 | Study Group 3 and 4 |
|---|---|
| **Inclusion Criteria:** | |
| - Written informed consent<br>- Age ≥ 18 years<br>- DCIS (Tis) or all stages of invasive breast cancer (T1-T4, N0 or N+, M0) including all histopathological and biological subtypes (defined by ER/PR/HER2 status)<br>- Breast Surgery planned including ablative procedure or skin-sparing mastectomy with implant insertion (+/- Mesh/ADM) | - Written informed consent<br>- Age ≥ 18 years<br>- Surgical procedure planned with implant insertion (+/- Mesh/ADM) with or without subcutaneous mastectomy |
| **Exclusion Criteria** | |
| - Age <18 Jahre<br>- Male sex<br>- Breast cancer patients planned for breast conserving therapy<br>- Recurrent breast cancer<br>- History of breast surgery<br>- Diagnosis of LCIS only<br>- Pregnancy at time of diagnosis<br>- Patients with a known immunodeficiency<br>- History of cancer (any kind) | - Age <18 years<br>- Male sex<br>- History of breast surgery<br>- Pregnancy at time of surgery<br>- Patients with a known immunodeficiency<br>- History of cancer (any kind) |

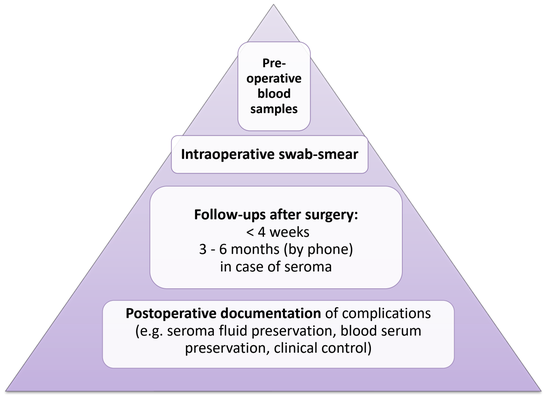


**Figure 2.** Study procedures

## Target accrual

2200 participants in total.

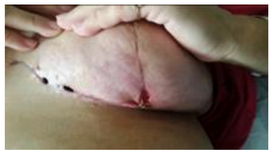

**Figure 3a**. Wound Dehiscence after Implant Based Reconstruction and seroma formation

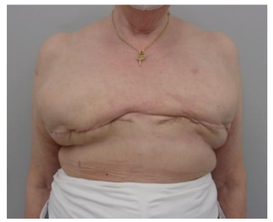

**Figure 3b**. Seroma after bilateral mastectomy

## Current status of the study

Following the current finalization of the logistics phase the study **is open for recruitment**. The study is currently **expanding worldwide.**

## Primary endpoint

**The hypothesis** to be tested is: seromas after mastectomy arise **from immunological and proinflammatory processes** leading to **the possible identification of a patient group with an elevated risk of developing a seroma.** It is planned to examine the groups with and without postoperative seroma formation exploratory **regarding immunological markers in blood samples** (all patients) as well as **in seroma fluid** (if occurred). In addition, **local microbiome analyses**, as well as **tumor analyses** with focus on microenvironment will be performed to **differentiate possible carcinoma-specific immunological processes**.

## Secondary endpoints

In order to answer the question of whether differences in seroma formation are **caused by locally driven or systemic immunological or cancer-related factors**, groups with and without postoperative seroma formation will be further examined in subgroups.

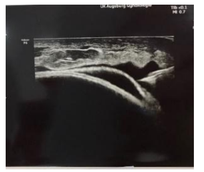

**Figure 4**. Needle aspiration

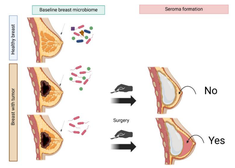


**Figure 5**. Microbiome tests

## Contact

Nina Ditsch
University Hospital Augsburg, Germany
Email: nina.ditsch@uk-Augsburg.de
Website: www.uk-augsburg.de
Phone: +49 821 400 165809

## Affiliations

[1]Clinic for Gynecology and Obstetrics, University Augsburg, Augsburg, GERMANY, [2]Institute of Environmental Medicine and Integrative Health, University Augsburg, Augsburg, GERMANY, [3]Breast Surgery, The London Clinic, London, GERMANY, [4]Digital Medicine, University Augsburg, Augsburg, GERMANY, [5]Institute of Biostatistics and Registry Resarch, Brandenburg Medical School Theodor Fontane, Neuruppin, GERMANY, [6]Clinic for Gynecology and Obstetrics, University Rostock, Rostock, GERMANY, [7]Clinic for Radiotherapy, University Augsburg, Augsburg, GERMANY, [8]University Medical Center / Clinic for Radiooncology, University Hamburg-Eppendorf, Hamburg, GERMANY, [9]Clinic for Gynecology and Obstetrics, University Düsseldorf, Düsseldorf, GERMANY, [10]Molecular Cell Biology / Institute of theoretical Medicine, University Augsburg, Augsburg, GERMANY, [11]Clinic for Gynecology and Obstetrics, Gesundheitscampus Wesel, Wesel, GERMANY, [12]Modeling and Simulation of Biological Processes, University Augsburg, Augsburg, GERMANY, [13]Clinic for Gynecology and Obstetrics, Ospedale Regionale di Lugano, Lugano, SWITZERLAND, [14]Clinic for specialized Gynecology, University Salzburg, Salzburg, AUSTRIA, [15]Clinic for Surgery, University Zielonogorski, Zielonogorski, POLAND, [16]General Surgery Department, Breast and Endocrine Unit, Zonguldak BEUN The School of Medicine, Zonguldak, TURKEY, [17]Department of Surgical Oncology, University Cluj-Napoca, Cluj-Napoca, ROMANIA, [18]Clinic for Gynecology and Obstetrics / Breast Cancer and CCC Munich, University LMU München, München, GERMANY, [19]Clinic for Gynecology and Obstetrics, University Ulm, Ulm, GERMANY, [20]University Hospital Helios Wuppertal, University Witten/Herdecke, Witten-Herdecke, GERMANY, [21]Clinic for Gynecology and Obstetrics, Agaplesion Markus Hospital Frankfurt, Frankfurt, GERMANY, [22]Operative therapy of the Breast GmbH, SENO MVZ München, München, GERMANY, [23]Clinic for Gynecology and Obstetrics, University Basel, Basel, SWITZERLAND, [24]Clinic for Gynecology and Obstetrics, University Aachen, Aachen, GERMANY, [25]Department of Pathology, University Medical Center Hamburg-Eppendorf (UKE), Hamburg, GERMANY, [26]Clinic for Gynecology and Obstetrics, University Erlangen, Erlangen, GERMANY, [27]Knappschaft Kliniken Marienhospital Bottrop, Bottrop, GERMANY, [28]Brustzentrum, Hospital of Weinheim, Weinheim, GERMANY, [29]Clinic for Gynecology and Obstetrics, Niels-Stensen-Kliniken Harderberg, Harderberg, GERMANY, [30]Clinic for Gynecology and Obstetrics, University Leipzig, Leipzig, GERMANY, [31]Clinic for Gynecology and Obstetrics, Hospital Ebersberg, Ebersberg, GERMANY, [32]Clinic for Gynecology and Obstetrics, Caritas-Krankenhaus Bad Mergentheim, Bad Mergentheim, GERMANY, [33]Breast Surgery Unit, San Raffaele University and Research Hospital, University Milan, Milan, ITALY, [34]Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Stockholm, SWEDEN, [35]Clinic for Gynecology and Obstetrics, Helios Klinik Berlin-Buch, Berlin, GERMANY, [36]Clinic for Gynecology and Obstetrics, Filderklinik, Fildertstadt-Bonlanden, Filderstadt-Bonlanden, GERMANY, [37]Clinic for Gynecology and Obstetrics, University Schleswig-Holstein, Lübeck, Lübeck, GERMANY.