

Abstract

ONCODAILY MEDICAL JOURNAL

A Systematic Comparison of ICG Fluorescence vs Dual-Tracer Sentinel Lymph Node Biopsy in Breast Cancer Staging

Authors: Julia Gauthier¹,✉

Affiliation: ¹University of Manchester

Corresponding Author: julia.gaut2007@gmail.com

DOI:10.69690/ODMJ-018-0826-7965



2nd Annual National Undergraduate Oncology Conference
Northwest (NUOC Northwest 2026)

Published: August 25, 2026

Abstract

A Systematic Comparison of ICG Fluorescence vs Dual-Tracer Sentinel Lymph Node Biopsy in Breast Cancer Staging

Authors: Julia Gauthier¹,✉

Affiliation: ¹University of Manchester

Corresponding Author: julia.gaut2007@gmail.com

ABSTRACT

Introduction: Sentinel lymph node biopsy (SLNB) is the standard of care for staging breast cancer. SLNB uses the dual tracer technique, incorporating a radioisotope (Tc99m) and a blue dye (Patent Blue). An alternate approach to performing SLNB is with an indocyanine green (ICG) fluorescence guided surgical (FGS) technique. This review evaluates whether ICG achieves non-inferior outcomes while addressing the limitations of the dual-tracer standard.

Methodology: This is a systematic comparison to establish a comparative review via the INFLUENCE trial (N=220), the GREENORBLUE Trial (n=300), Gâta et al (n=476), and Mulita et al.'s pooled systematic review. The outcomes assessed include identification rate, false negative rate, adverse events, cosmetic result, and logistical considerations.

Results: All studies included in this review had identification rates of 93%-100% : ICG performed non-inferior to dual-tracer benchmarks across all included studies. Furthermore, the INFLUENCE trial demonstrated that ICG alone had an identification rate of 98.2%. False negative rates remained within the acceptable clinical threshold (<10%). The GREENORBLUE trial reported 4 adverse events in the blue dye group (skin tattooing or

anaphylaxis), whereas there was no reported adverse event via ICG alone. Additionally, ICG eliminates radiation exposure and dependence on nuclear medicine, and requires no cold chain for storage.

Conclusion: ICG fluorescence-guided SLNB demonstrates non-inferior efficacy with a superior safety and cosmetic profile. Its logistical advantages should facilitate an increased adoption across surgical settings. Additional long-term follow-up data from axillary surgeries are necessary before definitive replacement of the dual-tracer standard can be recommended.

License

© Author(s) 2026.

This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, and unrestricted adaptation and reuse, including for commercial purposes, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

To view a copy of this license, visit
<https://creativecommons.org/licenses/by/4.0/>