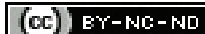


When Art Meets Science: Chromogenic Media- A Revolutionary Tool in Diagnostic Microbiology

M MOHAMADIYA RIZWANA¹, S SHANMUGA PRIYA²

Keywords: American society of microbiology, Agar art, Deoxyribonucleic acid, Rosalind elsie franklin

Dear Editor,

The present and future in any field rely mainly on the strong fundamentals of the past. The best example of this is Rosalind Elsie Franklin, popularly known as the “Dark Lady of DNA” as she remained the most controversial female in the field of science. She was also known as the unsung hero of DNA because she was not promptly recognised for her contribution to the discovery of DNA [1]. The image “Photograph 51,” depicting the double helical structure of DNA using X-ray crystallography experiments, was a crucial finding in the discovery of the genetic structure [2]. She serves as the best role model for budding scientists, and the authors have portrayed her on the agar plate as a tribute to her priceless contribution, which has formed the basis of modern diagnostic microbiology [3].

The artwork depicted in [Table/Fig-1] was created using HiCrome UTI agar (chromogenic) medium as the base. Chromogenic media are non selective media that contain essential ingredients to support the growth of most bacterial pathogens. Chromogenic media also contain tryptophan deaminase, which inhibits swarming and aids in the detection of *Proteus* species [4]. Studies have advocated the sensitivity and specificity of chromogenic media in identifying pathogens from clinical samples, thereby reducing turnaround

time in processing [5]. The media was prepared according to the manufacturer’s instructions. A marker pen was used to draw the art behind the petri dish. The bacterial isolates used for streaking were *Escherichia coli* ATCC 25922, *Enterococcus faecalis* ATCC 29212, and *Proteus mirabilis* ATCC 12453, which produced purple, green, and brown colours, respectively, following overnight incubation at 37°C for 18-24 hours.

Chromogenic media is one of the most economical methods for the rapid and accurate identification of common bacteria encountered. Additionally, appropriate chromogenic media can be used to rapidly screen antibiotic-resistant bacteria. Through art, authors would like microbiologists to utilise this beautiful technology for early patient care. The agar art photographic image was submitted to the American Society for Microbiology (ASM) agar art contest 2022, conducted by ASM under the theme “Your Favorite Microbiologist.” It won first place in the “Asia” section under the Professional category among 200 submissions by ASM in November 2022 [6].

Acknowledgement

The authors would like to acknowledge Dr. B. Appalaraju, Professor and Head, Department of Microbiology, PSGIMS&R, for providing the platform to execute their ideas.

REFERENCES

- [1] Selya R. Essay Review: Defined by DNA. The Intertwined Lives of James Watson and Rosalind Franklin [Review of Rosalind Franklin: The Dark Lady of DNA; Watson and DNA: Making a Scientific Revolution, by B Maddox & VK McElheny]. Journal of the History of Biology. 2003;36(3):591-97.
- [2] Thompson J, Braun G, Tierney D, Wessels L, Schmitzer H, Rossa B, et al. Rosalind Franklin’s X-ray photo of DNA as an undergraduate optical diffraction experiment. American Journal of Physics. 2018;86(2):95-104.
- [3] Washington JA. Principles of Diagnosis. In: Baron S, editor. Medical Microbiology. 4th edition. Galveston (TX): University of Texas Medical Branch at Galveston; 1996. Chapter 10. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK8014/>.
- [4] Khalid M. Comparison of chromogenic (HiCrome urinary tract infection agar) medium with cysteine lactose electrolyte deficient agar in a resource-limited setting. Int J Appl Basic Med Res. 2021;11(1):09-13.
- [5] Bajoria A, Kaore M, Kaur NS, Gautam KS. Utility of chromogenic media against conventional culture techniques for isolation of bacterial uropathogens in resource poor settings. Natl J Laboratory Med. 2019;8(1):MO05-08.
- [6] <https://asm.org/Events/ASM-Agar-Art-Contest/Previous-Winners/2022>. (Date of Accession November 30, 2022).



[Table/Fig-1]: Microbial art created using the HiCrome UTI agar (chromogenic) medium as the base.

The organisms used for the microbial art were: *Enterococcus faecalis* ATCC 29212- Blue-green; *Escherichia coli* ATCC 25922- Purple to magenta; *Proteus mirabilis* ATCC 12453- Light brown

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Microbiology, PSG Institute of Medical Sciences and Research, Coimbatore, Tamil Nadu, India.
2. Assistant Professor, Department of Microbiology, PSG Institute of Medical Sciences and Research, Coimbatore, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. M Mohamadiya Rizwana,
Off Aninashi Road, Peelamedu, Coimbatore, Tamil Nadu, India.
E-mail: mrizwana123@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Aug 08, 2023
- Manual Googling: Oct 14, 2023
- iThenticate Software: Oct 17, 2023 (9%)

ETYMOLOGY: Author Origin

EMENDATIONS: 5

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? NA
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: Aug 08, 2023

Date of Peer Review: Oct 13, 2023

Date of Acceptance: Oct 18, 2023

Date of Publishing: Jan 01, 2024