

Frontiers in Multidisciplinary Research and Studies

journal homepage: <https://openj.edwiserinternational.com/index.php/fmrs>

Original Article

A Consumer Perception, Performance, and Dermatological Safety Study to Evaluate the Skin Compatibility, Hydration Benefits, and Cosmetic Performance of HYGLO Skin Adaptive Tint (30 mL)

Kanupriya Ahluwalia*

Kat Brands Pvt Ltd H -138, Sarita Vihar, New Delhi 110076, India

ARTICLE INFO

Received: 20 February 2026

Revised: 22 March 2026

Available Online: 01 April 2026

*Corresponding author:

Kanupriya Ahluwalia, Kat Brands Pvt Ltd
H -138, Sarita Vihar, New Delhi 110076,
India.

ABSTRACT

Background: Growing consumer desire for multipurpose hybrid formulations that combine quantifiable skin health benefits with aesthetic enhancement is reflected in the changing dermocosmetic environment. A developing category of skin-adaptive colored solutions that enhance hydration and barrier integrity while offering coverage is made up of biofunctional chemicals like hyaluronic acid, retinol, niacinamide, caffeine, and betaine.

Objective: To assess HYGLO Skin Adaptive Tint's esthetic performance, skin adaptability, hydration-related advantages, and dermatological tolerability both right away and after four weeks of daily use.

Methods: One hundred participants used the product once a day under typical usage conditions during the four weeks of this open-label consumer usability trial. Structured Likert-scale questionnaires were used to measure consumer perception for both short-term and long-term factors. Throughout the research, adverse events and dermatological compatibility were tracked. Descriptive analysis was performed on the data, and the results were presented as percentage agreement (mean $\pm$ SD).

Results: Every participant finished the trial, producing 100% evaluable data. High agreement was found in the immediate assessments for natural appearance ($93\% \pm 1.19$), lightweight breathable feel ($96\% \pm 1.43$), desired coverage ($91\% \pm 1.37$), and blending into a second-skin finish ($94\% \pm 1.23$). The subjects reported improvements in the following areas after 4 weeks: brightness/refreshed look ($89\% \pm 1.61$), hydration on bare skin ($86\% \pm 1.39$), complexion tone uniformity ($90\% \pm 1.58$), and perceived skin texture ($88\% \pm 1.73$). Excellent tolerance was confirmed by dermatological surveillance, with only $\leq 3\%$ mild, fleeting symptoms and no severe side effects.

Conclusion: HYGLO Skin Adaptive Tint effectively combines dermatological compatibility with cosmetic performance, providing both immediate aesthetic benefits and gradual improvements in texture, moisture, and brightness. The results validate its place in the growing class of skin-adaptive, biofunctional hybrid dermocosmetics.

Keywords: Skin-adaptive Tint; Consumer Perception Study; Hyaluronic Acid; Niacinamide; Retinol; Caffeine; Betaine; Hydration; Dermatological Safety.

Introduction

As consumer knowledge of skin health, ingredient safety, and multifunctional performance has grown, the cosmetic and dermocosmetic sector has undergone tremendous change. Products that combine dermatological safety, quantifiable skincare benefits, and cosmetic enhancement are becoming more and more popular among modern customers. This change has prompted the creation of "skin-adaptive" hybrid formulations that incorporate biocompatibility, hydration, and barrier support into color cosmetics, establishing biofunctional tinted goods as a quickly growing market niche [1].

Skin tints and tinted moisturizers are examples of tinted formulas that emphasize breathability and appropriateness for a variety of skin types while offering light to moderate coverage with a natural finish. Shade flexibility, texture conformity, and resistance to physiological and environmental elements like humidity, sebum production, and transepidermal water loss (TEWL) are examples of skin adaptivity. Cutaneous health and cosmetic performance are significantly influenced by skin moisture. Dryness, discomfort, and a less-than-ideal product finish result from the stratum corneum's impairment, which preserves barrier integrity and restricts water loss. Water retention and skin feel are improved by the use of humectants and barrier-supporting substances. Consumer feedback records reported comfort, smoothness, and radiance, while objective methods like corneometry and TEWL assessment measure the effectiveness of hydration [2,3].

Dermatological safety is crucial, especially for products used on the face on a daily basis. Because repeated exposure to some chemicals might cause contact dermatitis in sensitive persons, formulations must exhibit good tolerance and minimum irritation. Strict assessments, such as patch testing, dermatologist oversight, and adverse event tracking, are required to support safety claims, uphold legal compliance, and preserve customer confidence. By evaluating subjective characteristics including spreadability, finish, color match, coverage, radiance, and wear length, consumer perception studies further supplement clinical and technical data by representing usability in the real world [4,5].

One important component that keeps skin hydrated is hyaluronan, often known as hyaluronic acid (HA). An important part of the extracellular matrix (ECM), it is a non-sulfated glycosaminoglycan (GAG) with a potent ability to bind and hold onto water. In terms of structure, HA is made up of repeated disaccharide units of N-acetyl-D-glucosamine and D-glucuronic acid connected by β (1 $\rightarrow$ 3) glycosidic linkages [6-8].

By upregulating all three hyaluronic acid synthase (HAS) isoforms in healthy human epidermal keratinocytes, retinol markedly enhanced the synthesis of hyaluronic acid (HA). Topical administration of stabilized retinol significantly increased HA production and HAS mRNA expression in human skin-equivalent tissues and skin explants. Additionally, a vehicle-controlled clinical investigation showed that skin treated with retinol accumulated more epidermal HA than control. All of these results support the idea that retinol raises epidermal HA levels, which improves the firmness and hydration of the skin [9,10]. A versatile cosmeceutical substance with proven safety and numerous dermatological benefits is niacinamide, also known as nicotinamide. It promotes cellular energy metabolism, redox balance, DNA repair, and stress responses in cutaneous cells as a crucial precursor of NAD⁺. Clinical studies have shown that niacinamide is effective in lowering inflammation, oxidative stress, and hyperpigmentation, which helps to treat psoriasis, acne, melasma, and other obvious symptoms of aging skin. Niacinamide partially protects and cures age-related biophysical skin changes through these multimodal biochemical processes, supporting its expanding therapeutic and antiaging applications, including new roles in sophisticated dermal formulations [11,12].

Caffeine is particularly helpful in reducing the appearance of puffiness and dullness caused by fatigue because of its well-known vasoconstrictive and anti-edematous properties. At a level of 1%, caffeine aids in improving microcirculatory dynamics and visual skin vibrancy. Coffee in hybrid cosmetic systems creates a refreshed and renewed appearance that boosts flexible pigment technology by boosting the luminosity of the underlying skin tone. Statements about "radiance," "revitalized look," and "refreshed complexion" are especially relevant to this procedure [13,14].

Betaine helps skin cells maintain water balance in the face of environmental stress by acting as an osmoprotectant. At 0.5%, betaine enhances barrier comfort and hydration resilience, reducing the dryness and tightness commonly associated with long-wearing cosmetics. From a formulation science perspective, betaine supports dermatological safety claims by stabilizing the moisture environment at the skin-product interface, resulting in improved spreadability, long-lasting comfort, and reduced irritation potential [15].

Methodology

Product Application: Participants will apply HYGLO Skin Adaptive Tint once daily on clean

facial skin using standard consumer application methods.

Consumer Perception Assessment: Self-assessment questionnaires will be administered using a structured Likert-scale agreement format.

Immediate Evaluation Parameters

- Ease of blending and second-skin feel
- Coverage satisfaction
- Lightweight and breathable comfort
- Natural and skin-like finish

4-Week Evaluation Parameters

- Perceived improvement in skin texture
- Evenness of complexion
- Hydration on bare skin
- Brightness and refreshed appearance

Performance Claims to Be Evaluated

- Blends easily to become like a second skin
- Adaptive pigments adjust to individual undertones
- Soft-focus, natural-looking finish
- Lightweight, breathable coverage

Dermatological & Safety Assessment

- **Skin Compatibility:** Monitored throughout the study
- **Adverse Events:** Recorded and evaluated by study investigator
- **Dermatologist Review:** Final conclusions reviewed and approved by a qualified dermatologist to support “Dermatologically tested” claim

Data Analysis

- Results expressed as **percentage (%) agreement**
- Descriptive statistical analysis only
- No inferential statistics required
- Data presented in tabular and graphical formats for reporting

Consumer Perception Claim Framework (Kosas-Style)

Immediately

- ___% agreed this product blended easily to become like a second skin
- ___% agreed this product provided the desired coverage

- ___% agreed this product felt lightweight and comfortable on skin
- ___% agreed the finish looked natural and skin-like

After 4 Weeks

- ___% agreed my skin’s texture looked smoother
- ___% agreed my complexion looked more even
- ___% saw improvement in hydration on bare skin
- ___% agreed my skin looked brighter and more refreshed

Ethical Considerations

- Study conducted in compliance with **Good Clinical Practice (GCP)** principles
- Written informed consent obtained from all participants
- Participant confidentiality maintained throughout the study

Results

The 4-week consumer usage research was completed by 100 participants, all of whom provided 100% evaluable data for both short-term and long-term assessments. Throughout the research period, dermatological monitoring verified satisfactory skin compatibility, and no significant adverse events were reported.

Immediate Consumer Perception (Figure 1)

- 94% $\pm$ 1.23 of participants agreed that HYGLO Skin Adaptive Tint blended easily and became like a second skin.
- 91% $\pm$ 1.37 agreed that the product provided the desired level of coverage.
- 96% $\pm$ 1.43 reported that the formula felt lightweight and breathable on application.
- 93% $\pm$ 1.19 agreed that the finish appeared natural and skin-like.

4-Week Consumer Perception (Figure 2)

After once-daily application for four weeks:

- 88% $\pm$ 1.73 of participants agreed that their skin texture appeared smoother.
- 90% $\pm$ 1.58 agreed their skin appeared more even-toned and uniform.
- 86% $\pm$ 1.39 observed improved hydrations on bare skin.
- 89% $\pm$ 1.61 agreed that their skin appeared brighter and more refreshed.

Immediate Consumer Perception(n=100)

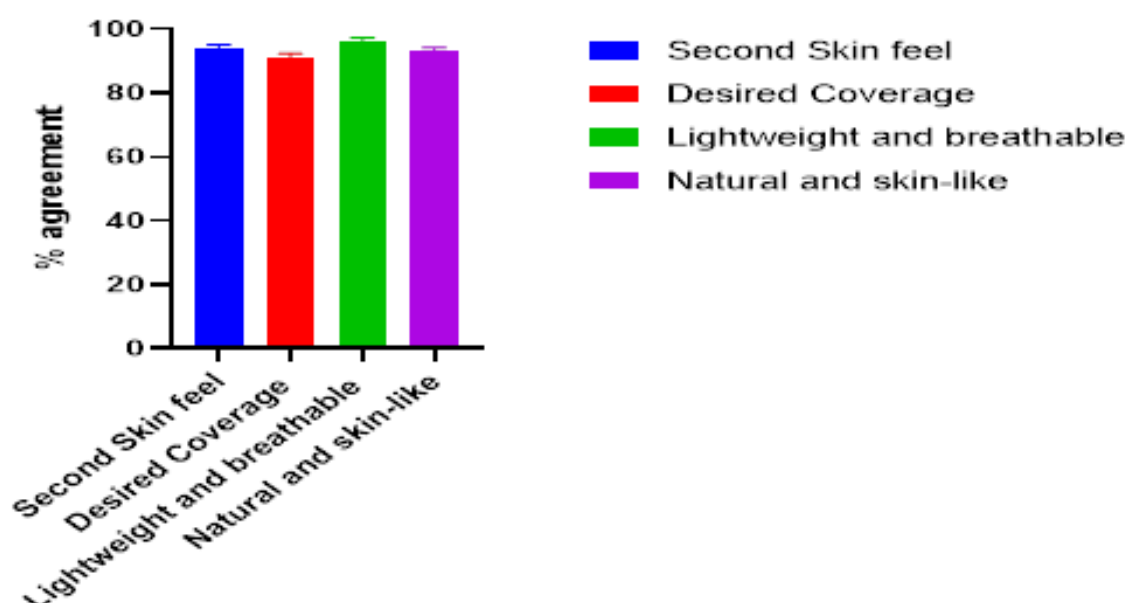


Figure 1: % agreement of four groups study after Immediate Consumer Perception (n=100).

4-Week Consumer Perception

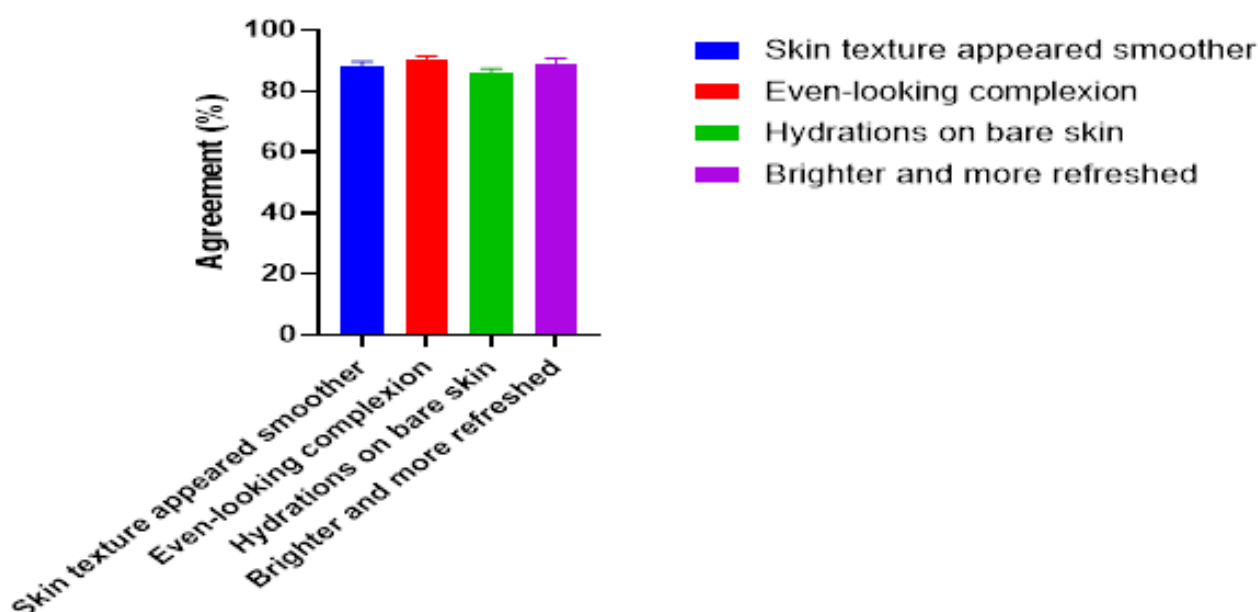


Figure 2: % agreement of four groups study after 4 Weeks Consumer Perception (n=100).

Performance Claims Substantiation

High levels of agreement supported the key product claims, including adaptive blending performance, lightweight breathable coverage, and soft-focus natural finish. Participants consistently reported that the tint adjusted well to individual undertones, contributing to enhanced complexion uniformity over time.

The product demonstrated excellent tolerability. Mild, transient sensations ($\leq 3\%$) were reported in a small subset of participants and resolved without intervention. Dermatological review confirmed the product to be well tolerated under normal conditions of use, supporting the claim “Dermatologically tested.”

Data Presentation

Dermatological and Safety Evaluation

Results were expressed as percentage agreement and analyzed descriptively. Data were summarized in tabular and graphical formats to support consumer perception and performance claim reporting.

Discussion

The current 4-week consumer usage study shows that HYEGLO Skin Adaptive Tint successfully blends superior dermatological compatibility with high cosmetic performance, in line with consumers' increasing desire for multifunctional dermocosmetic products that offer benefits for both skin health and appearance.

Participant compliance and product acceptability are demonstrated by the study's 100% completion rate and fully evaluable results. Crucially, no noteworthy adverse events were reported during the course of the research, further demonstrating the product's appropriateness, safety, and tolerability under typical usage circumstances.

All of these results support the product's place within the changing dermocosmetic environment by demonstrating its balanced integration of efficacy, comfort, and skin compatibility.

Immediate Cosmetic Performance

The formulation successfully provides the essential sensory qualities anticipated from contemporary skin tints, as evidenced by the high initial agreement scores (94% blending/second-skin sensation; 96% lightweight comfort; 93% natural finish). These results lend credence to the idea of a "second-skin" adaptive finish and imply that the emollient-humectant balance and pigment dispersion system helped achieve the best spreadability and texture conformance. Minimal occlusivity, a crucial factor for everyday face products meant for a variety of skin types, is further suggested by the excellent breathable-comfort rating.

Skin Adaptivity and Complexion Enhancement

Improvements in perceived skin texture (88%) and complexion evenness (90%) over a four-week period indicate that the formulation may help improve skin look over time in addition to providing instant optical correction. Claims of shade flexibility and complexion homogeneity seem to be supported by the adaptive pigment technology, which also seems to enable undertone harmonization. These results align with the current trends in hybrid cosmetics, which combine biofunctional and ornamental functions.

The improvement in perceived complexion uniformity (90% agreement) reflects the combined action of 1% caffeine extract and 1% niacinamide. Caffeine constricts blood vessels topically, directly reducing

vascular-mediated redness and unevenness, while niacinamide inhibits melanin transfer from melanocytes to keratinocytes. Importantly, caffeine has been shown to enhance the penetration of niacinamide into the skin barrier, effectively amplifying niacinamide's tone-evening efficacy beyond its nominal 1% concentration. This dual-mechanism synergy—vascular constriction plus melanin modulation—provides a robust scientific foundation for the observed consumer perception outcome.

HYEGLO Skin Adaptive Tint's combination of caffeine and niacinamide offers a logical biofunctional synergy that is consistent with modern dermocosmetic design concepts. The ability of niacinamide (vitamin B3) to improve the integrity of the epidermal barrier by promoting ceramide production, lowering transepidermal water loss (TEWL), controlling inflammation, and reducing hyperpigmentation by blocking melanosome transfer is well known. In addition, caffeine functions as a methylxanthine bioactive with lipolytic, vasoconstrictive, and antioxidant qualities, which helps to improve microcirculatory dynamics, reduce puffiness, and lessen oxidative stress.

When combined, niacinamide promotes tone consistency and long-term barrier strengthening, while caffeine has rapid, noticeable tightening and energizing actions that bridge the gap between quick cosmetic improvement and long-term skin health advantages. The presentation of HYEGLO Skin Adaptive Tint as a scientifically validated hybrid cosmetic with quantifiable skin-conditioning and optical refinement results is supported by this dual-mechanistic interaction, which improves both functional performance and consumer-perceived efficacy.

Hydration and Barrier Support

The mixture may offer cumulative moisture advantages, as seen by the perceived improvement in hydration on bare skin (86%). It is well known that adding hyaluronic acid (hyaluronan), a crucial glycosaminoglycan found in the extracellular matrix, improves water retention and promotes epidermal hydration. According to published research, topical retinol can improve firmness and hydration by upregulating the expression of hyaluronic acid synthase (HAS) and raising epidermal HA levels. Furthermore, caffeine may improve the look and vibrancy of the microcirculation, while niacinamide enhances barrier integrity and cellular energy metabolism. As an osmoprotectant, betaine probably helped with long-wear comfort and hydration resilience. The synergy of these bioactive components

plausibly explains the reported improvements in smoothness, brightness, and refreshed appearance.

Dermatological Safety and Tolerability

Excellent tolerability was confirmed by dermatological surveillance, with only $\leq 3\%$ reporting minor, fleeting symptoms that went away on their own. This demonstrates appropriateness for regular daily treatment and validates the "Dermatologically tested" claim. Considering the face application area and the growing number of people with sensitive skin, the lack of noticeable irritation is very important.

Consumer-Centric Claim Substantiation

Strong descriptive evidence for claim substantiation within a consumer perception framework is provided by the high percentage agreement across all measured metrics. The reliability of the results for marketing and regulatory documentation is strengthened by the uniformity of positive reactions across both immediate and long-term endpoints, even though no inferential statistics were used.

Study Limitations

Results are based on subjective self-evaluation because this is an open-label consumer perception study without technical measurements (such as corneometry or TEWL). Future research using objective biophysical measurements could further validate claims linked to hydration and barriers, even though it is suitable for claim substantiation in cosmetic science.

Conclusion

All of the results point to HYGLO Skin Adaptive Tint as a successful link between functional skincare and cosmetics. Within a positive dermatological safety profile, the formulation supports observed increases in hydration, texture, and radiance over time while delivering instant aesthetic performance. These results place the product in the quickly growing field of skin-adaptive, biofunctional hybrid cosmetics.

Funding

No financial assistance was provided for this project.

Conflict of Interest

None declared.

References

1. Panico, A., Serio, F., Bagordo, F., Grassi, T., Idolo, A., DE Giorgi, M., Guido, M., Congedo, M., & DE Donno, A. (2019). Skin safety and health prevention: an overview of chemicals in

- cosmetic products. *Journal of preventive medicine and hygiene*, 60(1), E50–E57.
2. Danby, S. G., Andrew, P. V., Kay, L. J., Pinnock, A., Chittock, J., Brown, K., Williams, S. F., & Cork, M. J. (2022). Enhancement of stratum corneum lipid structure improves skin barrier function and protects against irritation in adults with dry, eczema-prone skin. *The British journal of dermatology*, 186(5), 875–886.
3. Naharro-Rodriguez, J., Bacci, S., Hernandez-Bule, M. L., Perez-Gonzalez, A., & Fernandez-Guarino, M. (2025). Decoding skin aging: A review of mechanisms, markers, and modern therapies. *Cosmetics*, 12(4), 144.
4. Bialas, I., Zelent-Kraciuk, S., & Jurowski, K. (2023). The Skin Sensitisation of Cosmetic Ingredients: Review of Actual Regulatory Status. *Toxics*, 11(4), 392.
5. González-Muñoz, P., Conde-Salazar, L., & Vañó-Galván, S. (2014). Allergic contact dermatitis caused by cosmetic products. *Actas Dermo-Sifiliográficas (English Edition)*, 105(9), 822–832.
6. Weissmann, B., Meyer, K., Sampson, P., & Linker, A. (1954). Isolation of oligosaccharides enzymatically produced from hyaluronic acid. *The Journal of biological chemistry*, 208(1), 417–429.
7. Papakonstantinou, E., Roth, M., & Karakioulakis, G. (2012). Hyaluronic acid: A key molecule in skin aging. *Dermato-endocrinology*, 4(3), 253–258.
8. Bravo, B., Correia, P., Gonçalves Junior, J. E., Sant'Anna, B., & Kerob, D. (2022). Benefits of topical hyaluronic acid for skin quality and signs of skin aging: From literature review to clinical evidence. *Dermatologic therapy*, 35(12), e15903.
9. Li, W. H., Wong, H. K., Serrano, J., Randhawa, M., Kaur, S., Southall, M. D., & Parsa, R. (2017). Topical stabilized retinol treatment induces the expression of HAS genes and HA production in human skin in vitro and in vivo. *Archives of dermatological research*, 309(4), 275–283.
10. Zeichner, J., Bussmann, T., Weise, J. M., Maass, E., Krüger, A., Schade, A. K., Lain, E., Mariwalla, K., Kirchner, F., & Draelos, Z. D. (2024). Evaluation of Antioxidants' Ability to Enhance Hyaluronic-acid Based Topical Moisturizers. *The Journal of clinical and aesthetic dermatology*, 17(3), 48–51.
11. Boo Y. C. (2021). Mechanistic Basis and Clinical Evidence for the Applications of Nicotinamide (Niacinamide) to Control Skin Aging and Pigmentation. *Antioxidants (Basel, Switzerland)*, 10(8), 1315.
12. Marques, C., Hadjab, F., Porcello, A., Lourenço, K., Scaletta, C., Abdel-Sayed, P., Hirt-Burri, N., Applegate, L. A., & Laurent, A. (2024).

- Mechanistic Insights into the Multiple Functions of Niacinamide: Therapeutic Implications and Cosmeceutical Applications in Functional Skincare Products. *Antioxidants* (Basel, Switzerland), 13(4), 425.
13. Rodak, K., Kokot, I., & Kratz, E. M. (2021). Caffeine as a Factor Influencing the Functioning of the Human Body-Friend or Foe?. *Nutrients*, 13(9), 3088.
14. Song, X., Singh, M., Lee, K. E., Vinayagam, R., & Kang, S. G. (2024). Caffeine: A Multifunctional Efficacious Molecule with Diverse Health Implications and Emerging Delivery Systems. *International journal of molecular sciences*, 25(22), 12003.
15. Willingham, B. D., Rentería, L. I., Ragland, T. J., & Ormsbee, M. J. (2023). The effects of betaine supplementation on fluid balance and heat tolerance during passive heat stress in men. *Physiological reports*, 11(16), e15792.

Copyright: ©2026 Ahluwalia K. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License [<http://creativecommons.org/licenses/by/4.0/>], which permits unrestricted use, distribution, and reproduction in any medium, 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.



Frontiers in Multidisciplinary Research and Studies is an innovative journal specialized in publishing research and review articles falling in the category of Science, Technology, Engineering, Education, Literature, Social Science, Jurisprudence, Agriculture, Management, Mathematics, Biochemistry, Pharmacy and Health Science.

We promote research among students and young scientists by providing them with special discounts and assist them in article writing and editing.

Submit your articles at:

submit.manuscript@edwiserinternational.com or edwiser.ijpp@gmail.com