# Scientific Developmental Editing Test I

**Name:**

**Date:**

When performing a scientific developmental edit of a manuscript, the following elements should be considered:

* Evaluating the overall structure and organization of the manuscript
* Determining whether the methods are described in a way that is repeatable
* Ensuring results address all elements of the experimental methods and that all results have a predicate in the methods
* Checking for accuracy and consistency of scientific facts and data
* Suggesting revisions to improve the flow and readability of the manuscript
* Providing feedback on the overall tone and style of the writing
* Identifying and correcting errors in grammar, spelling, and punctuation
* Ensuring the language used is clear and concise

Keeping this list in mind, we present this assessment in two parts: **Editing** and **Letter to the Author**.

**Scenario:**

The client provides assistance to authors in the preparation of their manuscripts for submission to a journal for peer review. They have asked for a scientific developmental edit to give the author as guidance for revisions they should make prior to submitting to a journal.

The client has supplied the author manuscript, which is provided in **Appendix 1**.

PART 1: Editing

Text from a sample manuscript is provided in Appendix 1. The sample is comprised of a Methods section and a Results section from the same scientific manuscript. Perform a scientific developmental edit.

1. With track changes activated, edit Appendix 1 for grammar, spelling, and style consistency.
2. Reword and/or reorganize text for better comprehension.
3. Comparing the Methods and Results, insert comments to the author regarding inconsistencies, missing information, or issues with the science.
4. Gather overall feedback about the piece and how it is written.

**PART 2: Letter to Author**

Write a professional letter to the author of the sample manuscript text in Appendix 1. Insert letter at the end of the tracked changes manuscript text.

1. Use typical elements of a professional letter (e.g., address block, salutation, signature block, etc.).
2. List feedback for Methods first, under the heading Methods, followed by feedback for the Results, under the heading Results.
3. List general feedback under the heading General Feedback. This section should contain comments about the organization of the text and how it is written, whether the science presented is sound, and suggestions for improving the manuscript.

Send completed Scientific Developmental Editing Test I as an email attachment to deved.freelancers@kwglobal.com.

**APPENDIX 1**

**Materials and Methods**

**Collection of Samples**

The fermented maize (Ogi) used for this study was prepared at Fountain University’s Laboratory while cheese (Waara), fermented milk mixed with fermented cereal (Fura) and fermented milk (Nunu) were collected directly from the Fulani’s living in Oke-Osun, Osogbo, Osun State Nigeria. The *Pseudomonas aeruginosa* strains used in this study were obtained from the Microbiology Laboratory of Fountain University.

**Isolation of Lactic Acid Bacteria and *Pseudomonas aeruginosa***

Stock solutions of 10% of fermented Fura and Waara was prepared by dissolving 1 ml each of the samples in 9ml of sterile distilled water in a test tube and was serially diluted while nunu and ogi samples were first soaked for 48 hours in a tightly sealed container and 1ml was added into 9 ml of sterile distilled water and serially diluted before they were inoculated into sterile Skim milk agar plates using pour plate method. The plates were incubated anaerobically at 32oC for 48hrs and observed for microbial growth. Concurrently, an already identified clinical isolate of *P. aeruginosa* was sub-cultured from the Microbiology Laboratory of Fountain University.

**Identification and Characterization of Lactic Acid Bacteria**

The lactic acid bacteria (LAB) strains isolated were identified by morphological, phenotypic and biochemical characteristics using Bergey’s Manual of Systemic Bacteriology as a reference.

The numbers of microbial colonies were counted. The total viable count was then determined using the expression:

Total Viable Count = (Number of Colonies × Volume Inoculated)/Dilution Factor

Distinct colonies were sub-cultured on fresh plates then purified and maintained on appropriate slants at 4°C for further analyses.

**Quantitative determination of Lactic acid production by isolates**

The production of lactic acid was determined by titrating 10 ml of the homogenized sample against 0.25 mol/l NaOH using 1 ml of phenolphthalein indicator (0.5% in 50% alcohol). The titratable acidity was calculated as percentage lactic acid (v/v). Each milliliter of 1 N NaOH is equivalent to 9.008 mg of lactic acid.

**Determination of Hydrogen Peroxide production by isolates**

Twenty-five milliliters of the fermenting samples and 20 ml of diluted H2SO4 were titrated against 0.1 N potassium permanganate. 1 ml is equivalent to 1.70 mg of H2O2.

**pH determination**

The pH of the fermenting substrates was measured daily with the electrode of a pH meter standardized with distilled water.

**Identification and Characterization of *Pseudomonas aeruginosa***

Biochemical tests were used to authenticate the identity of the *P, aeruginosa* isolate. The tests included: Gram stain, catalase test, oxidase test, citrate test motility test.

**Categorization of Acquired Resistance Profiles in *P. aeruginosa* Strain**

*Pseudomonas aeruginosa* strains were inoculated onto Mueller-Hinton agar plates (0.5 McFarland) by streaking. Antibiotic paper disks for gram negative bacteria were then placed on the plates in aseptic conditions and the plates were incubated at 35 °C for 18h. All data were entered and analyzed using WHONET 5.6 software.

**Biofilm formation using Microtiter-plate test**

Biofilm formation by *P. aeruginos*a strains was assayed using a 96-well polystyrene microtiter plate. These strains were grown at 37 °C in Luria– Bertani (LB) medium containing 0.25% glucose for 24 h. Using M63 medium, the cultures were diluted (1:100) and then 200 μL of the bacterial suspension was added to sterile 96-well microtiter plates and then incubated for 24 h at 37 °C. The wells were washed three times with 300 μL distilled water, dried and then stained with 200 μL of 0.1% crystal violet for 15 min. The wells were washed three times using distilled water and were stained with 200 μL of 30% acetic acid in water. In the de-staining solution, the absorbance was measured at 570 nm using a spectrophotometer.

**Quantitative Biofilm Detection**

Biofilm formation in microtiter-plate was carried out in triplicates and the average optical density was calculated for each bacterial strain. For the purposes of comparative analysis of test, we introduced classification of adherence capabilities of tested strains into four categories as follows;

OD ≤ ODc non-adherent

ODc < OD ≤ 2 × ODc weakly adherent

2 × ODc < OD ≤ 4 × ODc moderately adherent

4 × ODc < OD strongly adherent

The cutoff optical density (ODc) for biofilm formation was defined as three standard deviations (SD) above the mean OD of the negative control.

**Assessment of Antibiofilm Activity of LAB Strains; (Liquid Co-culture Assay in Microtiter Plate)**

The capability of LAB strains to interfere with the growth of *P. aeruginosa* strains was evaluated by co-culture method in microtiter plate. The isolated *Lactobacillus fermentii* and *Lactococcus lactis* strains and the *P. aeruginosa* strains were grown on Skim milk broth and Lysogeny broth (LB), respectively. The 0.5 McFarland turbidity (1.5 × 108 CFU/mL) of these suspensions was prepared and 100 μL of cell-free supernatant of LAB strains and 100 μL of the *P. aeruginosa* strains were added together to a 96-well microtiter plate and incubated for 24 h at 37 °C. Positive controls were prepared by inoculating the same medium with the *P. aeruginosa* strains alone. To check whether the pathogens were inhibited or killed, 50 μL of co-culture suspension was seeded on Mueller-Hinton agar medium and incubated at 37 °C for 24–48 h. By comparing the growth with a negative (100% inhibition) and a positive control (0% inhibition), the growth inhibition values of pathogens were estimated by looking at the growth under microscope to evaluate the predominant cells on agar plates of the co-culture after the 24-h incubation.

**Results**

**Morphological Identification of Isolated Bacteria**

Observation of colonies on the different agar plates indicated that different microorganisms were present in the samples.

**Biochemical Characteristics and Identification of the Isolated Bacteria**

A total of 20 bacterial isolates were isolated from *Fura, Nono, Waara* and ogi samples. Bacteria colonies were identified based on their morphological and biochemical characteristics using standard references organisms. The bacterial isolates of interest were identified based on the microscopic characteristics of Gram’s reaction as described in Bergey’s manual of Determinative Bacteriology. From the total isolates, *Lactococcus lactis, Lactobacillus fermentii, Enterococcus* sp*., Staphylococcus* sp*.,* were identified in varying frequencies from *Fura, Nono, Waara* and Ogi. *Pseudomonas aeruginosa* isolate was also subjected to biochemical tests.

**pH determination**

The pH was measured at daily intervals from 0 hours of incubation to 72 hours after incubation. pH levels ranged from 5.9 - 4.66 in *L. fermentii* and 5.21 - 4.55 in *Lactococcus lactis*. Reduction in pH during fermentation is due to the fermentative transformation of carbohydrates to lactic acid.

**Quantitative determination of Lactic acid production by isolates**

The lactic acid produced by the LAB strains ranged within 2.25-0.9 g/L in *L. fermentii* from day 0 to day 3. *Lactococcus lactis* had the highest (2.72g/L) at 36 hrs after incubation.

**Determination of Hydrogen Peroxide production by isolates**

Figure 4 shows the hydrogen peroxide produced by the LAB isolates, the highest (1.05 g/L) was produced by *Lactococcus lactis* at 0 hrs after incubation. The Hydrogen peroxide production subsequently remains somewhat constant between *Lactococcus lactis* and *Lactobacillus fermentii.*

**Categorization of Antibiotic Resistance Profiles in *P. aeruginosa* strains**

Result analysis using WHONET 5.6 software showed that all 5 isolated strains were multidrug- resistant (MDR). MDR was defined as acquired non-susceptibility to at least one agent in three or more antimicrobial categories. The most effective antibiotic against the *P. aeruginosa* strains was Gentamicin with only 5% resistance and high percentages of resistance observed against other studied antibiotics.

**Quantitative biofilm detection using 96-well microtiter plate assay**

Using comparison with established ODc value, the five *P. aeruginosa* isolates are categorized according to adherence capabilities. P1 was a moderately adherent biofilm producer, 2 were weakly adherent and 2 were non-adherent and did not form biofilms. At 570nm, the spectrophotometric results obtained were averaged and expressed as numbers. The average OD values for all tested strains are shown in Table 3.