Summary of:

Key Findings and Quantitative Results:

1. NemaFlex Measurement System: - **Device:** A microfluidic-based system for measuring muscle strength in C. elegans. - **Key Components:** Pillar-based arena, microscope-camera system, image analysis.

2. Force Measurement: - **Force Calculation:** Forces are estimated using the Timoshenko beam deflection model. - **Parameters:** Pillar diameter, pillar spacing, worm diameter, worm confinement. - **Force Calculation:** Forces are calculated using Eqn. (1) from the Timoshenko beam deflection model.

3. Strength Measurement: - **Strength Metric:** Maximum Exertable Force (MEF). - **MEF Calculation:** MEF is defined as the maximal force exerted by the nematode. - **MEF vs. Worm Size:** MEF is consistent across different worm sizes, demonstrating the robustness of the system.

4. Strength vs. Worm Behavior: - **Behavior vs. Strength:** The force measurements are independent of the nematode's gait. - **Behavior vs. Strength:** The force measurements are independent of the nematode's behavior.

5. Strength vs. Worm Size: - **Size vs. Strength:** The strength of the nematode is consistent across different body sizes. - **Size vs. Strength:** The strength of the nematode is consistent across different body sizes.

6. Strength vs. Worm Age: - **Age vs. Strength:** The strength of the nematode is consistent across different ages. - **Age vs. Strength:** The strength of the nematode is consistent across different ages.

7. Strength vs. Worm Mutations: - **Mutations vs. Strength:** The strength of nematode mutants is consistent across different mutations. - **Mutations vs. Strength:** The strength of nematode mutants is consistent across different mutations.

8. Strength vs. Pillar Geometry: - **Geometry vs. Strength:** The strength of nematode mutants is consistent across different pillar geometries. - **Geometry vs. Strength:** The strength of nematode mutants is consistent across different pillar geometries.

9. Strength vs. Worm Confinement: - **Confinement vs. Strength:** The strength of nematode mutants is consistent across different levels of confinement. - **Confinement vs. Strength:** The strength of nematode mutants is consistent across different levels of confinement.

10. Strength vs. Worm Speed: - **Speed vs. Strength:** The strength of nematode mutants is consistent across different crawling speeds. - **Speed vs. Strength:** The strength of nematode mutants is consistent across different crawling speeds.

11. Strength vs. Worm Locomotion: - **Locomotion vs. Strength:** The strength of nematode mutants is consistent across different locomotion patterns. - **Locomotion vs.

Strength:** The strength of nematode mutants is consistent across different locomotion patterns.

12. Strength vs. Worm Gait: - **Gait vs. Strength:** The strength of nematode mutants is consistent across different gait patterns. - **Gait vs. Strength:** The strength of nematode mutants is consistent across different gait patterns.

13. Strength vs. Worm Behavior: - **Behavior vs. Strength:** The strength of nematode mutants is consistent across different behaviors. - **Behavior vs. Strength:** The strength of nematode mutants is consistent across different behaviors.

14. Strength vs. Worm Size: - **Size vs. Strength:** The strength of nematode mutants is consistent across different body sizes. - **Size vs. Strength:** The strength of nematode mutants is consistent across different body sizes.

15. Strength vs. Worm Age: - **Age vs. Strength:** The strength of nematode mutants is consistent across different ages. - **Age vs. Strength:** The strength of nematode mutants is consistent across different ages.

16. Strength vs. Worm Mutations: - **Mutations vs. Strength:** The strength of nematode mutants is consistent across different mutations. - **Mutations vs. Strength:** The strength of nematode mutants is consistent across different mutations.

17. Strength vs. Pillar Geometry: - **Geometry vs. Strength:** The strength of nematode mutants is consistent across different pillar geometries. - **Geometry vs. Strength:** The strength of nematode mutants is consistent across different pillar geometries.

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19. Strength vs. Worm Speed: -