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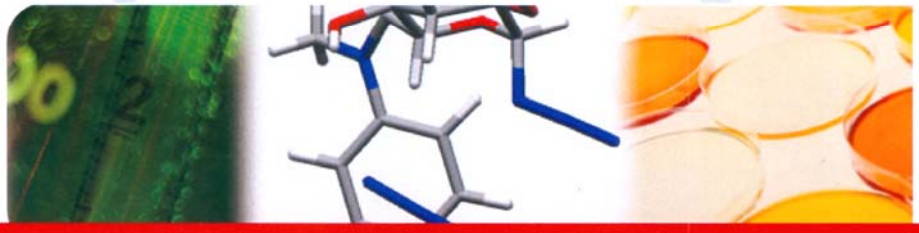

HOW TO ASSES DOSE-RESPONSE STUDY OUTCOME: A STATISTICAL APPROACH

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Confidence interval defines as an estimated range of values that is likely to include an unknown population parameter, the estimated range being calculates from a given set of sample data. Are uses in experimental research as a criterion of assessment of the trustworthiness or robustness of the finding. [1] It is well known that for low proportions, the lower confidence boundaries is frequently less than zero while for the proportions closer to the upper boundaries exceed one. [2,3] The main problem of the existent methods is represented by the inadequate coverage and inappropriate intervals. [3]

The binomial distribution has its origins and applications in the natural phenomena studies: heterometric bands of tetrameric enzyme, the stoichiometry of the donor and acceptor chromophores implied in enzymatic ligand/receptor interactions, translocation and exfoliation of type I restriction endonucleases, biotinidase activity on neonatal thyroid hormone stimulator, the parasite induced mortality at fish, the occupancy/activity for proteins at multiple nonspecific sites containing replication. [4] Carlton and Stansfield [5] defined very well the frame and limits of binomial distribution model applied to the natural phenomena.

A series of confidence intervals assessment methods were proposed. [6] The formula for probability calculation:

$$P_B(n,X,Y) = \frac{n!}{Y!(n-Y)!}\frac{X^Y(n-X)^{(n-Y)}}{n^n}$$

has been used in order to obtain the probability matrix. An algorithm for confidence intervals calculation has been developed and applied.

This project focuses on the application and usefulness of the proposed confidence intervals calculation algorithm and on its evaluation for a sample size of 30. The evaluation of the algorithm has been done by comparison with Logit, Jeffreys and Blyth-Still-Casella methods and the results are presented here.

References:

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[3] D. L. Brown, T. T. Cai, A. DasGupta, *Stat. Sci.* 2001, *16*, 101.
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