Spearman’s rank correlation coefficient is a nonparametric (distribution-free) rank statistic proposed by Charles Spearman as a measure of the strength of an association between two variables. It is a measure of a monotone association that is used when the distribution of data makes Pearson’s correlation coefficient undesirable or misleading. Since we are dealing with data that is not bivariately normally distributed, the Spearman Rank is a better choice for our data.

In R, this can be easily implemented as “*cor.test(x, y, method="pearson")”*

From the R-documentation: “*If method is "kendall" or "spearman", Kendall's tau or Spearman's rho statistic is used to estimate a rank-based measure of association. These tests may be used if the data do not necessarily come from a bivariate normal distribution.”* This ones again confirms this test is the correlation significance test suited for our data.

<https://rpubs.com/aaronsc32/spearman-rank-correlation>  
for mathemathical formulas & derivations