

Hypothesis

“We conclude that high-LET α -particles cause closely interspaced DSBs leading to high local concentrations of repair proteins”

Fe ion radiation (high LET) will result in more clustered damage than x-ray radiation (low LET)




International Journal of
Molecular Sciences



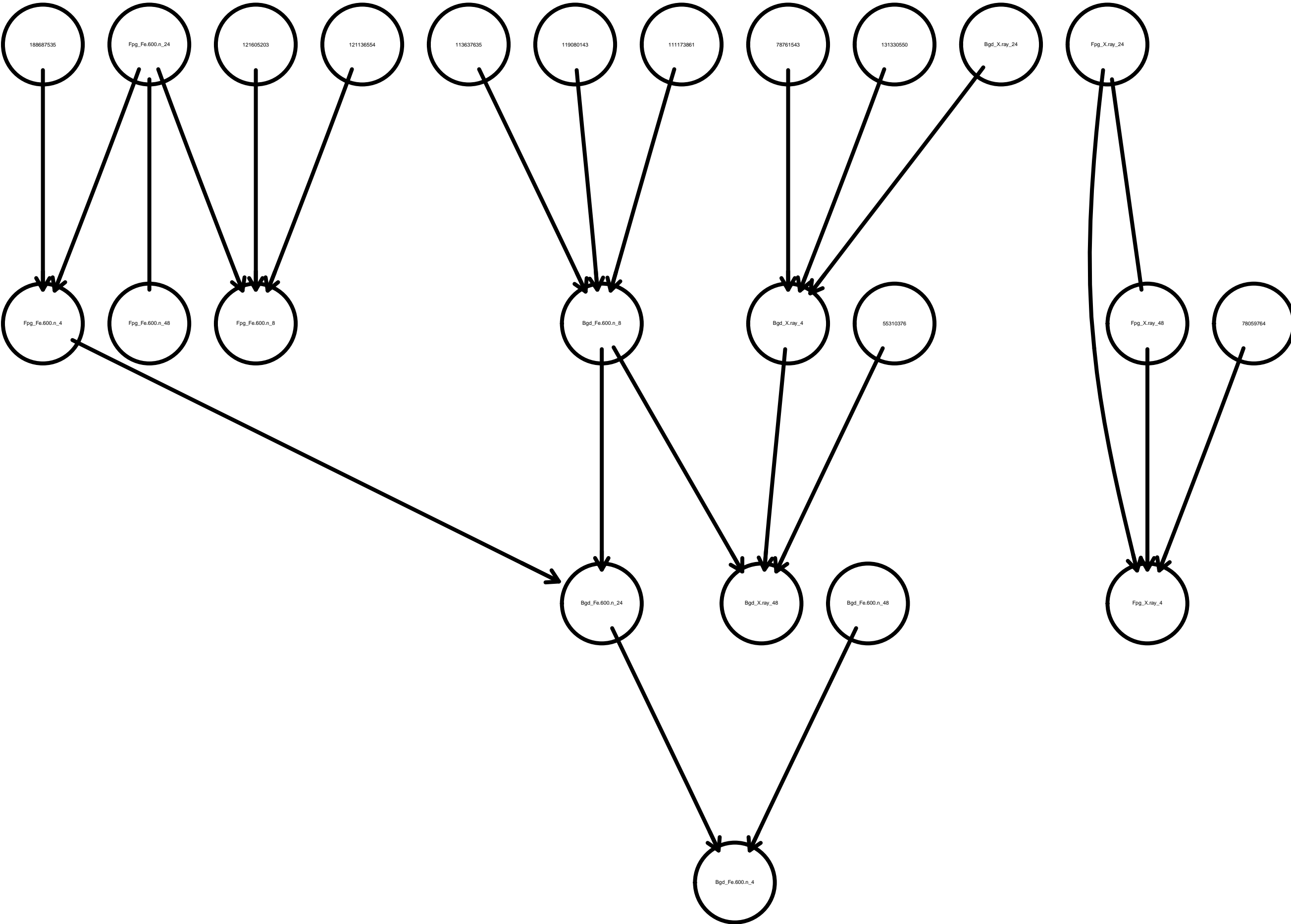
Article

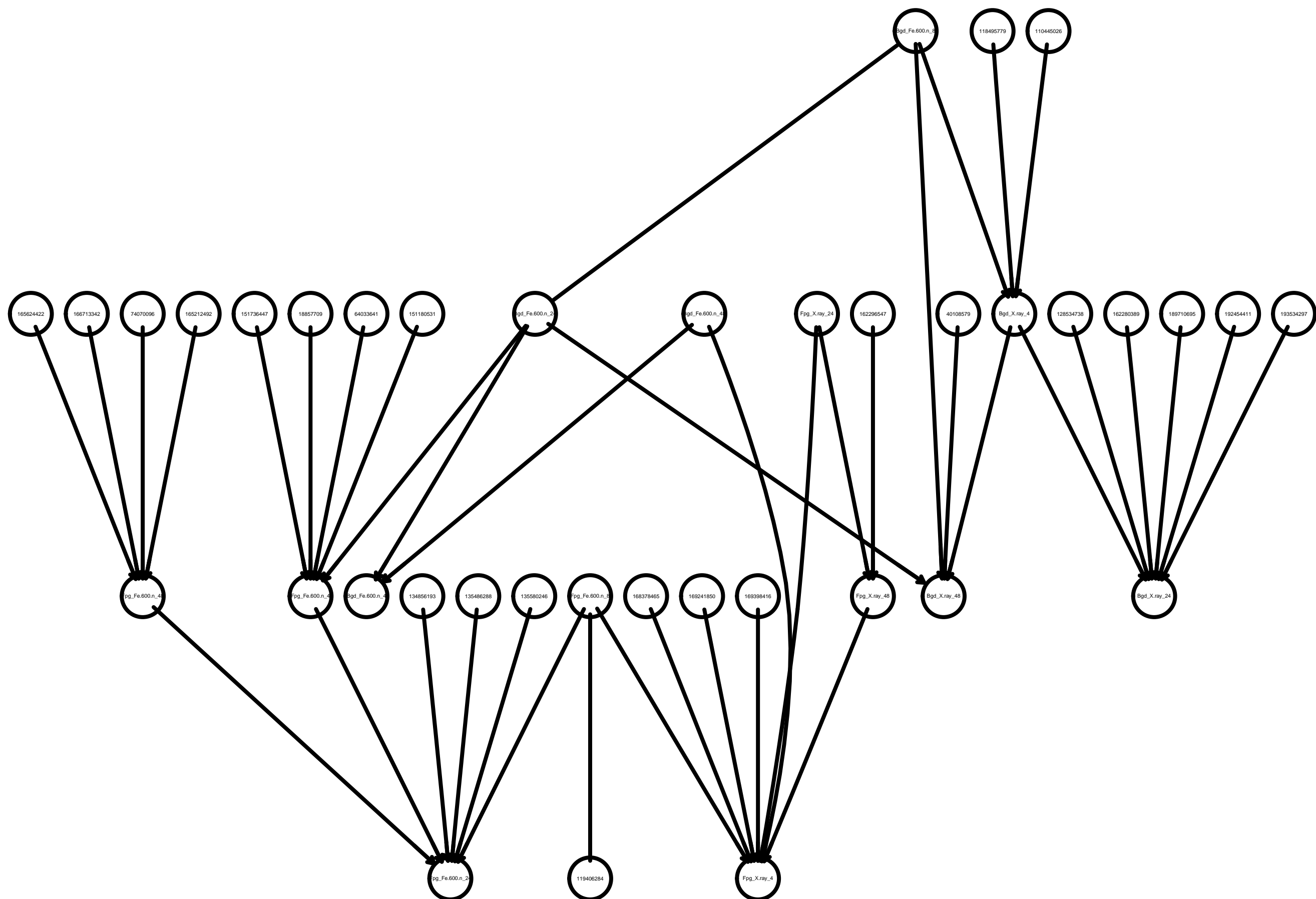
Comparison of High- and Low-LET Radiation-Induced DNA Double-Strand Break Processing in Living Cells

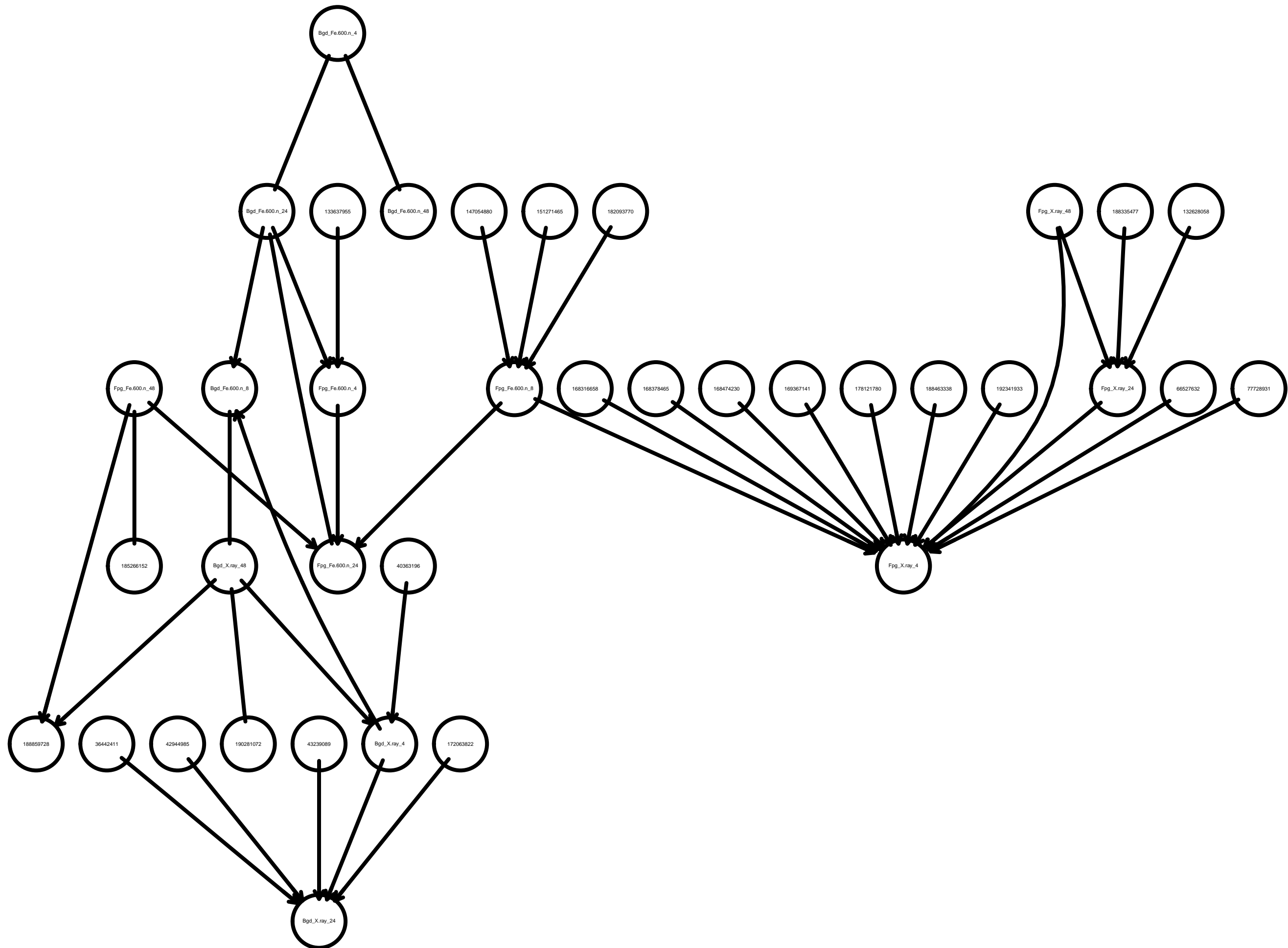
Stefan J. Roobol ^{1,2,3}, Irene van den Bent ¹, Wiggert A. van Cappellen ⁴, Tsion E. Abraham ⁴,
Maarten W. Paul ¹ , Roland Kanaar ^{1,2}, Adriaan B. Houtsmuller ⁴, Dik C. van Gent ^{1,2} and
Jeroen Essers ^{1,5,6,*}

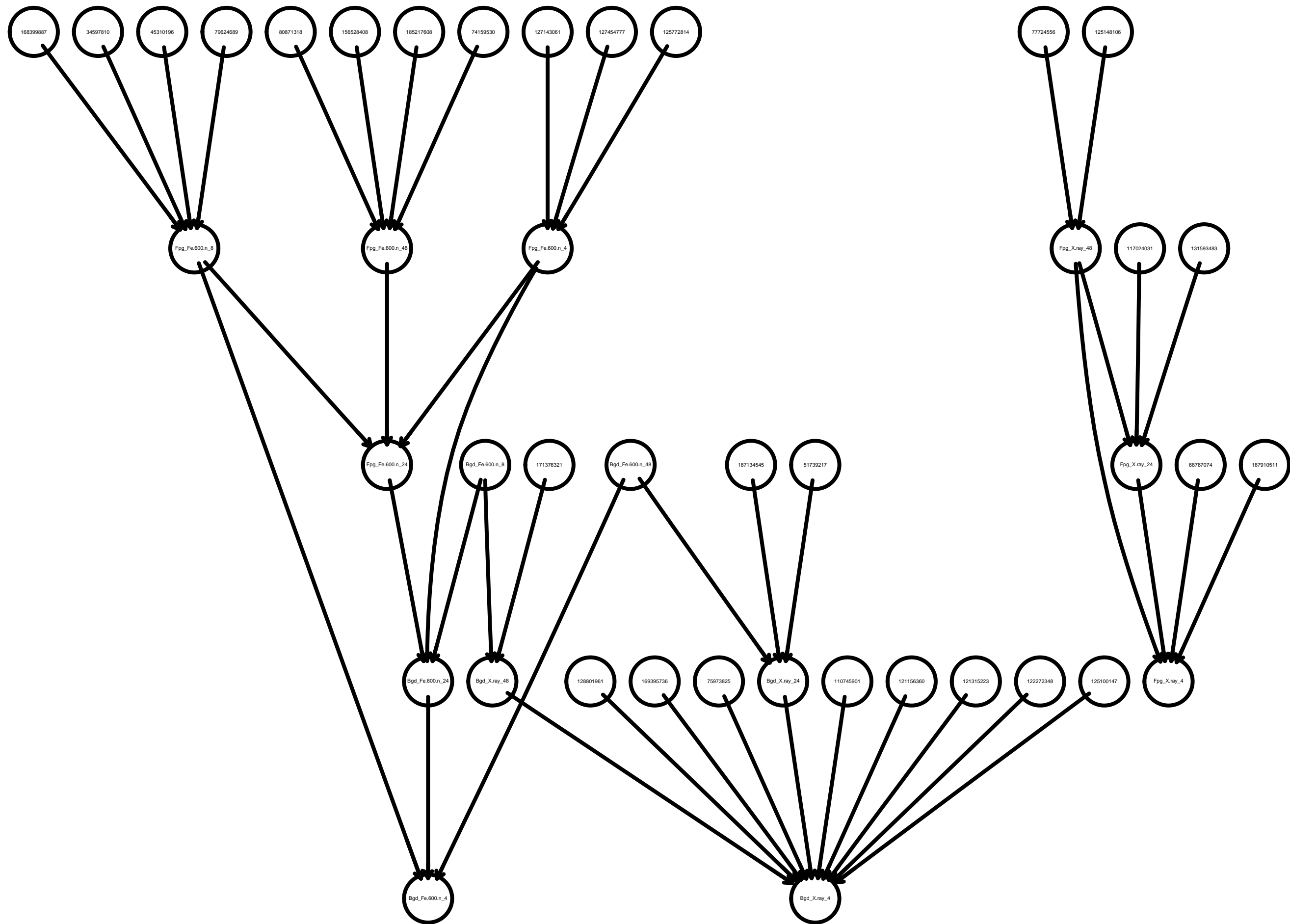
Data processing

- Remove (repeated) columns ending in '.1'
- Drop duplicate rows
- Separate the data into multiple CSV files based on values in the 'chromosome' column
- Read in singular chromosome csv file into R
- Delete unused columns
- Take a random subset of rows (sizes 100-300)
- One-hot-encode position b38









Top 5 smallest average gap (base pairs)

Fpg_X.ray_4 (200)	55981
Fpg_Fe.600.n_24 (200)	63652
Fpg_Fe.600.n_8 (100)	234824
Fpg_Fe.600.n_4 (300 2nd run)	685386
Bgd_Fe.600.n_8 (100)	2430299

Top 5 largest average gap (base pairs)

Bgd_X.ray_4 (100)	263095503
Bgd_X.ray_24 (300 2nd run)	67767664
Fpg_X.ray_4 (300 2nd run)	59571718
Fpg_X.ray_48 (300 2nd run)	53761675
Fpg_Fe.600.n_8 (300 2nd run)	41168539