We claim:

1. A method of validating data produced from a multiplexing process on an analytical instrument comprising:

using a pseudorandom sequence to encode a multiplexed segment of data by modulating introduction of analytes to a detector based on the pseudorandom sequence;

generating received intensity data with the detector;

applying a Hadamard transform to the received intensity data to generate a demultiplexed segment of the data;

aligning the pseudorandom sequence to the multiplexed segment of the data; and

calculating a score by summing at least one positive value in the demultiplexed segment of the data corresponding to a predefined value in the pseudorandom sequence to find a valid demultiplexed value.

2. The method of Claim 1 wherein aligning the pseudorandom sequence to the multiplexed segment of the data includes aligning a first '1' bit of the pseudorandom sequence to a positive value of the demultiplexed data.
3. The method of Claim 2 further comprising summing the multiplexed values that correspond to a '1' in the pseudorandom sequence.
4. The method of Claim 3 further comprising altering the alignment of the pseudorandom sequence to the multiplexed segment of the data wherein the first '1' bit of the pseudorandom sequence is aligned with a different positive value of the demultiplexed data, summing the multiplexed values that correspond to a '1' in the pseudorandom sequence, and repeating until all positive demultiplexed values have been scored.
5. The method of Claim 4 wherein the largest positive sum represents the valid demultiplexed value in the multiplexed segment of data.
6. The method of Claim 5 further comprising subtracting the valid multiplexed value from other positive multiplexed values that correspond to a '1' in the pseudorandom sequence to create a second multiplexed segment of values.
7. The method of Claim 6 further comprising finding additional valid demultiplexed values.
8. A method of validating demultiplexed data comprising:

providing a pseudorandom sequence;

receiving a multiplexed segment of data generated by applying a Hadamard transform to intensity data produced by a detector responsive to detecting analytes introduced into an analytical instrument according to the pseudorandom sequence; and

scoring each positive value in the demultiplexed data using the pseudorandom sequence, wherein if a score is above zero then the associated demultiplexed value is retained.

9. The method of Claim 8 further comprising repeating the scoring process until no further valid demultiplexed values are found.
10. The method of Claim 8 wherein the non-valid demultiplexed values are removed.
11. A method of validating demultiplexed data from a multiplexed segment of data after Hadamard transform comprising:

receiving the multiplexed segment of data after a Hadamard transform is applied to intensity data produced by a detector responsive to detecting analytes introduced into an analytical instrument according to a pseudorandom sequence;

aligning the pseudorandom sequence to the multiplexed segment of data, the aligning including aligning a first '1' bit of the pseudorandom sequence to a positive value of the demultiplexed data; and

calculating scores for each positive value in the demultiplexed segment of data, wherein the highest total score represents a valid demultiplexed value.

12. The method of claim 11 further comprising summing the multiplexed values that correspond to a '1' in the pseudorandom sequence.
13. The method of Claim 12 further comprising altering the alignment of the pseudorandom sequence to the multiplexed data wherein the first '1' bit of the pseudorandom sequence is aligned with a different positive value of the demultiplexed data, summing the multiplexed values that correspond to a '1' in the pseudorandom sequence, and repeating until all positive demultiplexed values have been scored.
14. The method of Claim 13 wherein a largest positive sum represents the valid demultiplexed value in the multiplexed segment of data.
15. The method of Claim 14 further comprising subtracting the valid multiplexed value from other multiplexed values that correspond to a '1' in the pseudorandom sequence to create a second multiplexed segment of values.
16. The method of Claim 15 further comprising finding additional valid demutliplexed values.