Figure S1.

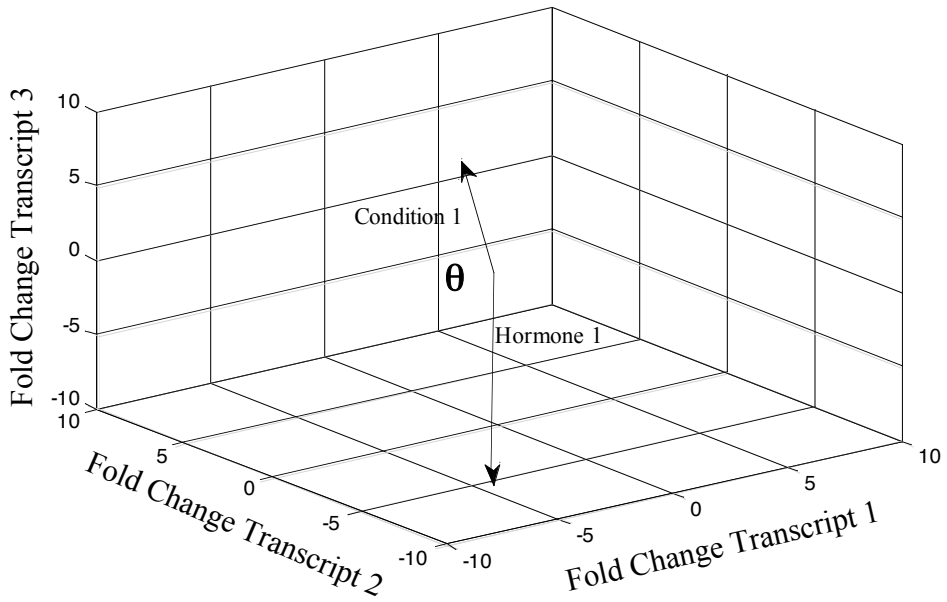

Figure S1. Example of the application of the vector-based correlation for comparison of the expression of 3 transcripts under two different conditions. A schematic diagram of the Euclidean space is used for illustrating how the correlation is calculated. Each axis on the diagram corresponds to a fold-change in activity of one of the three transcripts. Taking the fold-change of all 3 transcripts during a certain hormone treatment together (Hormone 1), yields a vector representing the fold changes in these transcripts. This vector is compared to a second vector representing the response of the same transcripts under a different condition (Condition 1). In this simplified example only 3 transcripts are used as the index, so each vector is illustrated in a three-dimensional space. The cosine of the angle θ between the vectors defines the correlation value. The actual index is composed of 1,000 transcripts so that each experiment is represented as a vector in a 1,000-dimensional space.

Vector-based calculation of the correlations

Figure S1 illustrates the values of the fold change in 3 transcripts in Condition 1 and the values of the fold change of these transcripts in Hormone 1. In the case illustrated, in Condition 1 transcript 1 is induced 5-fold, transcript 2 is induced 5-fold

and transcript 3 is induced 2-fold relative to a control condition. In Hormone 1 the same transcripts, i.e. transcripts 1, 2 and 3 are 5, 6 and 9 -fold decreased respectively relative to its control (no hormone). Thus, Condition 1 is represented by a vector with the coordinates (5,5,2) and Hormone 1 is represented by a vector with the coordinates (-5,-6,-9).

The correlation between Hormone 1 and Condition 1 is the cosine of the angle between the vectors. Thus for finding the correlation two vectors (V and U) are defined:

$$V = (v_1, v_2, v_3 \ldots v_n)$$

where v_1, v_2, v_3 etc. represent the fold changes for each transcript in the index of size n, the list is used to define the vector in the particular experiment being scanned:

$$U = (u_1, u_2, u_3 \ldots u_n)$$

where u1, u2 etc. are conditionally included if their p value is <0.05. The cosine of the angle between the two vectors is then calculated:

$$V \bullet U / (|V| \bullet |U|)$$

In the simplified case above the correlation or cosine value =

$$\cos\theta = \frac{(-5 \times 5) + (-6 \times 5) + (-9 \times 2)}{\sqrt{(-5^2) + (-6^2) + (-9^2)} \times \sqrt{5^2 + 5^2 + 2^2}} = -0.83$$

When this is carried out over the 1,000 transcripts that comprise the index they describe a Euclidean space of a multi dimensional space (instead of the 3 dimensions used in the simplified example).